AUDIX®

CERTIFICATE OF CONFORMITY

For the following information

Ref. File No.: C1M1503003

Product	Intel® Compute Stick
Test Model	STCK1A32WFC
Family Product Code	xSTCK1xFCx (Where x may be a combination of alphanumeric characters or blank)
Brand Name	Intel®
Applicant	INTEL CORP.
Test Report Number	EM-E150125
Standards	EN 55022:2010 +AC: 2011, Class B EN 61000-3-2:2014 and EN 61000-3-3:2008 EN 55024:2010 (EN 61000-4-2:2009, IEC 61000-4-2:Ed. 2.0:2008, EN 61000-4-3:2006+A1:2008 +A2:2010, IEC 61000-4-3 Ed.3.2:2010, EN 61000-4-4:2012, IEC 61000-4-4 Ed. 3.0:2012 EN 61000-4-5:2006, IEC 61000-4-5 Ed. 2.0:2005, EN 61000-4-6:2014, IEC 61000-4-6 Ed. 4.0:2013, EN 61000-4-8: 2010, IEC 61000-4-8 Ed. 2.0:2009 EN 61000-4-11:2004, IEC 61000-4-11 Ed. 2.0:2004)

We hereby certify that the above product has been tested by us with the listed standards and found in compliance with the council EMC directive 2004/108/EC. The test data and results are issued on the EMC test report no. EM-E150125.

Signature

Allen Wang/Assistant General Manager
Date: 2015. 03. 17.

NVLAP Lab Code 200077-0

Testing Laboratory
1724

Test Laboratory:
AUDIX Technology Corporation, EMC Department
NVLAP Lab. Code: 200077-0
TAF Accreditation No.: 1724
FCC OET Designation: TW1004
Web Site: www.audixtech.com

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.

EMC TEST REPORT
for
INTEL CORP.
Intel® Compute Stick
Test Model: STCK1A32WFC
Family Product Code: xSTCK1xFCx
(Where x may be a combination of alphanumeric characters or blank)
Brand: Intel®

Prepared for : INTEL CORP.
HF3-96, 5200 NE ELAM YOUNG PKY,
HILLSBORO, OR 97124 USA

Prepared by : AUDIX Technology Corporation
EMC Department
No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan

Tel: (02) 2609-9301, 2609-2133
Fax: (02) 2609-9303

File Number	:	C1M1503003
Report Number	:	EM-E150125
Date of Test	:	2015. 03. 04 ~ 16
Date of Report	:	2015. 03. 17

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Description Page

EMC TEST REPORT

Applicant	:	INTEL CORP.
EUT Description	:	Intel® Compute Stick
(A) Test Model	:	STCK1A32WFC
(B) Family Product Code	:	xSTCK1xFCx (Where x may be a combination of alphanumeric characters or blank)
(C) Serial Number	:	N/A
(D) Brand Name	:	Intel®
(E) Power Supply	:	DC 5V, 2A
(F) Test Voltage	:	AC 230V, 50Hz (Via AC Adapter)

Measurement Standard Used:

EN 55022:2010 +AC: 2011, Class B

EN 61000-3-2:2014 and EN 61000-3-3:2013

EN 55024:2010
(EN 61000-4-2:2009, IEC 61000-4-2:Ed. 2.0:2008,
EN 61000-4-3:2006 +A1:2008 +A2:2010, IEC 61000-4-3 Ed.3.2:2010,
EN 61000-4-4:2012, IEC 61000-4-4 Ed. 3.0:2012,
EN 61000-4-5:2006, IEC 61000-4-5 Ed. 2.0:2005,
EN 61000-4-6:2014, IEC 61000-4-6 Ed. 4.0:2013,
EN 61000-4-8: 2010, IEC 61000-4-8 Ed. 2.0:2009
EN 61000-4-11: 2004, IEC 61000-4-11 Ed. 2.0:2004)

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device, its ensured severity levels, and performance criterion. This test report contains the measurement results, and AUDIX Technology Corporation assumes full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT is technically compliant with the requirements of EN 55022, EN 61000-3-2, EN 61000-3-3 and EN 55024 standards.

Date of Test: 2015. 03. 04 ~ 16 Date of Report: 2015. 03. 17

Producer: Tina Huang
(Tina Huang/Administrator)

Signatory: Allen Wang
(Allen Wang/Assistant General Manager)

1. DESCRIPTION OF VERSION

Edition No.	Date of Revision	Revision Summary	Report Number
0	2015. 03. 17	Original Report.	EM-E150125

2. SUMMARY OF STANDARDS AND RESULTS

2.1. Description of Standards and Results

The EUT has been tested according to the applicable standards as referenced below.

EMISSION			
Description of Test Item	**Standard**	**Limits**	**Results**
Conducted disturbance	EN 55022:2010 +AC: 2011	Class B	PASS
		Minimum passing margin is 13.69dB at 0.182MHz	
Conducted disturbance (Telecommunication port)	EN 55022:2010 +AC: 2011	Class B	N/A
Radiated disturbance (30-1000MHz)	EN 55022:2010 +AC: 2011	Class B	PASS
		Minimum passing margin is 4.28dB at 599.39MHz	
Radiated disturbance (Above 1GHz)	EN 55022:2010 +AC: 2011	Class B	PASS
		Minimum passing margin is 6.78dB at 1020.21MHz	
Harmonic current emissions	EN 61000-3-2:2014	Class D	PASS
Voltage fluctuations & flicker	EN 61000-3-3:2013	Section 5	PASS

IMMUNITY (EN 55024:2010)				
Description of Test Item	**Basic Standard**	**Standard Criteria**	**EUT Criteria**	**Results**
Electrostatic discharge	EN 61000-4-2:2009/ IEC 61000-4-2:Ed. 2.0:2008,	B	A	PASS
Radiated, Radio-frequency, electromagnetic file	EN 61000-4-3:2006 +A1:2008 +A2:2010/ IEC 61000-4-3 Ed.3.2:2010	A	A	PASS
Electrical fast transient/burst	EN 61000-4-4:2012/ IEC 61000-4-4 Ed. 3.0:2012	B	A	PASS
Surge (Input a.c. power ports)	EN 61000-4-5:2006/ IEC 61000-4-5 Ed. 2.0:2005,	B	A	PASS
Surge (Telecommunication ports)		B	N/A	N/A
Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6:2014/ IEC 61000-4-6 Ed. 4.0:2013	A	A	PASS
Power frequency magnetic field	EN 61000-4-8: 2010/ IEC 61000-4-8 Ed. 2.0:2009	A	A	PASS
Voltage dips, >95% reduction	EN 61000-4-11: 2004/ IEC 61000-4-11 Ed. 2.0:2004	B	A	PASS
Voltage dips, 30% reduction		C	A	PASS
Voltage interruptions		C	A	PASS

N/A is an abbreviation for Not Applicable.

2.2. Description of Performance Criteria

General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

— essential operational modes and states;

— tests of all peripheral access (hard disks, floppy disks, printers, keyboard, mouse, etc.);

— quality of software execution;

— quality of data display and transmission;

— quality of speech transmission.

2.2.1. **Performance criterion A**

During and after the test the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a minimum performance level specified by the manufacturer when the EUT is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the EUT if used as intended.

2.2.2. **Performance criterion B**

After the test, the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the EUT is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the EUT if used as intended.

2.2.3. **Performance criterion C**

During and after testing, a temporary loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls or cycling of the power to the EUT by the user in accordance with the manufacturer’s instructions.

3. GENERAL INFORMATION

3.1. Description of EUT

Product	Intel® Compute Stick
Test Model	STCK1A32WFC
Family Product Code	xSTCK1xFCx (Where x may be a combination of alphanumeric characters or blank)
Serial Number	N/A
Brand Name	Intel®
Applicant	INTEL CORP. HF3-96, 5200 NE ELAM YOUNG PKY, HILLSBORO, OR 97124 USA
Power Supply Rating	Refer to AC adapter rating
Date of Receipt of Sample	2015. 02. 26
Interface Ports of EUT	HDMI Port *1 USB 2.0 Port *1 Micro USB 2.0 *1 Micro SD Card Slot *1

3.2. Descriptions of Key Components and Operating Modes

3.2.1. List of key components under test

Item	Supplier	Model / Type	Character
Mother Board	Intel	STCK1A32WFC-IS	With 32G eMMC and 2GB memory
		STCK1A8LFC-IS	With 8G Emmc and 1GB memory
CPU (Socket: BGA592)	Intel	Intel® Atom™ CPU Z3735F@1.33GHz	1.33 GHz
Memory	HYNIX	H5TC4G63AFR-PBA	2GB IC DDR3L SDRAM.256M*16
		H5TC2G63FFR	1GB IC DDR3L SDRAM.128M*16
	Micron	MT41K128M16JT	1GB IC DDR3L SDRAM.128M*16
eMMC	SAMSUNG	KLMBG4GEND-B031	32G
		KLM8G1GEAC-B031	8G
	TOSHIBA	THGBMBG8D4KBAIR	32G
		THGBMBG6D1KBAIL	8G
	KINGSTON	EMMC32G-S100-WB9	32G
		EMMC08G-S100	8G
Wi-Fi +BT Combo Module	REALTEK	RTL8723BS	802.11 b/g/n Wireless LAN Bluetooth 2.1+EDR/BT4.0 for BT peripherals
Antenna	Linking Technology Inc.	T-543-8321061	PIFA Antenna, 2.95dBi
AC Adapter	Asian Power Device Inc.	WB-10G05R (Wall-mount, 2C)	AC Input: 100-240V~, 50-60Hz, 0.4A Max. DC Output: 5V, 2A
Micro USB Cable	Shielded, Detachable, 1.0m		
HDMI Cable	Shielded, Detachable, 0.2m		

Remark: For a more detailed features description, please refer to the manufacturer's specifications or the user manual.

3.2.2. List of operating modes under test:

SKU #1 ~ 14		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mother Board	Intel, STCK1A32WFC-IS	V	V	V	V	V	V	V	V	V	V	V	V	V	V
CPU	Intel, Z3735F	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Memory	HYNIX, H5TC4G63AFR-PBA	V	V	V	V	V	V	V	V	V	V	V	V	V	V
eMMC	SAMSUNG, KLMBG4GEND-B031	V			V	V	V	V	V	V	V	V	V	V	V
	TOSHIBA, THGBMBG8D4KBAIR		V												
	KINGSTON, EMMC32G-S100-WB9			V											
Wi-Fi +BT Combo Module	REALTEK, RTL8723BS	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Resolution	1920*1200 60Hz 32bit 200% Font Size	V	V	V							V	V	V	V	V
	1920*1080 60Hz 32bit 200% Font Size				V										
	1600*1200 60Hz 32bit 150% Font Size					V									
	1400*1050 60Hz 32bit 150% Font Size						V								
	1280*1024 75Hz 32bit 125% Font Size							V							
	1024*768 75Hz 32bit 100% Font Size								V						
	800*600 75Hz 32bit 100% Font Size									V					
Cable	with HDMI Cable	V	V	V	V	V	V	V	V	V		V	V	V	V
	without HDMI Cable										V				
AC Adapter	Asian, WB-10G05R.	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Test Voltage	AC 100V, 50Hz											V			
	AC 110V, 60Hz	V	V	V	V	V	V	V	V	V	V				
	AC 120V, 60Hz												V		
	AC 220V, 60Hz													V	
	AC 230V, 50Hz														V

3.2.3. According to radiated emission pre-test result, the EUT collocates with following worst components (SKU #1), which are used to establish a basic configuration of system during test:

Item	Supplier	Model / Type	Character
Mother Board	Intel	STCK1A32WFC-IS	With 32G eMMC and 2GB memory
CPU (Socket: BGA592)	Intel	Intel® Atom™ CPU Z3735F@1.33GHz	1.33 GHz
Memory	HYNIX	H5TC4G63AFR-PBA	2GB IC DDR3L SDRAM.256M*16
eMMC	SAMSUNG	KLMBG4GEND-B031	32G
Wi-Fi +BT Combo Module	REALTEK	RTL8723BS	802.11 b/g/n Wireless LAN Bluetooth 2.1+EDR/BT4.0 for BT peripherals
Antenna	Linking Technology Inc.	T-543-8321061	PIFA Antenna, 2.95dBi
AC Adapter	Asian Power Device Inc.	WB-10G05R (Wall-mount, 2C)	AC Input: 100-240V~, 50-60Hz, 0.4A Max. DC Output: 5V, 2A
Micro USB Cable	Shielded, Detachable, 1.0m		
HDMI Cable	Shielded, Detachable, 0.2m		

3.2.4. Description of Test Modes

The worst mode was reported for emission and immunity measurement.

Configuration Mode	Memory	eMMC	Resolution	Test Voltage
SKU #1	HYNIX, H5TC4G63AFR-PBA	SAMSUNG, KLMBG4GEND-B031	1920*1200 60Hz 32bit 200% Font Size	AC 230V, 50Hz

3.3. Description of Tested Supporting Unit and Cable

3.3.1. Support Peripheral Unit

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	USB Keyboard	DELL	SK-8175	MY-0W217F-71619-058-1522-A01	By DoC	Provided by LAB
B	LCD Monitor	DELL	U3011T	CN-0PH5NY-74445-1CM-142L	By DoC	Provided by LAB
C	MICRO SD Card	Kingston	NSDC4/8GB	N/A	N/A	Provided by LAB
D	BT Mouse	Logitech	M-R0047-O	1443LZ0A1DDS	FCC ID: JNZMR0047O	Provided by LAB
E	Notebook PC	Lenovo	TP00034A	895097	By DoC	Provided by LAB
F	Wireless Router	ASUS	RT-N53	N/A	FCC ID: MSQ-RT-N53	Provided by LAB

3.3.2. Cable Lists

No.	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	USB Cable	1	1.8	Yes	0	Provided by LAB
2	HDMI Cable	1	0.2	Yes	0	Supplied by Client
3	Micro USB Cable	1	1.0	Yes	0	Supplied by Client
4	LAN Cable	1	10.0	No	0	Provided by LAB

Note:
1. Support Units B: Power Cord: Non-Shielded, Detachable, 1.8m
2. Support Unit E: AC Adapter: DVE, M/N DSA-12G-12 FUS 120120;
   Power Cord: Non-Shielded, Detachable, 1.0m
3. Support Unit F: AC Adapter: Lenovo, M/N ADLX65NCT3A;
   DC Power Cord: Non-Shielded, Undetachable, 1.8m,
   Bonded a ferrite core
   AC Power Cord: Non-Shielded, Detachable, 1.0m
4. The support units (E-F) are communicated partner system.

3.4. Description of Test Facility

Name of Firm	:	**AUDIX Technology Corporation** **EMC Department** No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan
Test Facility & Location	:	**No. 7 Shielded Room &** **No. 1 10m Semi-Anechoic Chamber &** **Immunity Test Site** No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan
NVLAP Lab. Code	:	200077-0
TAF Accreditation No.	:	1724

3.5. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	±3.5dB
Radiation Test (Distance: 10m)	30MHz~1000MHz	±5.3dB
Radiation Test (Distance: 3m)	1GHz ~ 6GHz	±4.8dB
Radiated, Radio-frequency, Electromagnetic Field Test	80MHz~200MHz	±1.7dB
	200MHz~1000MHz	±1.8dB
	1GHz~6GHz	±1.7dB

Remark : Uncertainty = $ku_c(y)$

4. CONDUCTED DISTURBANCE MEASUREMENT

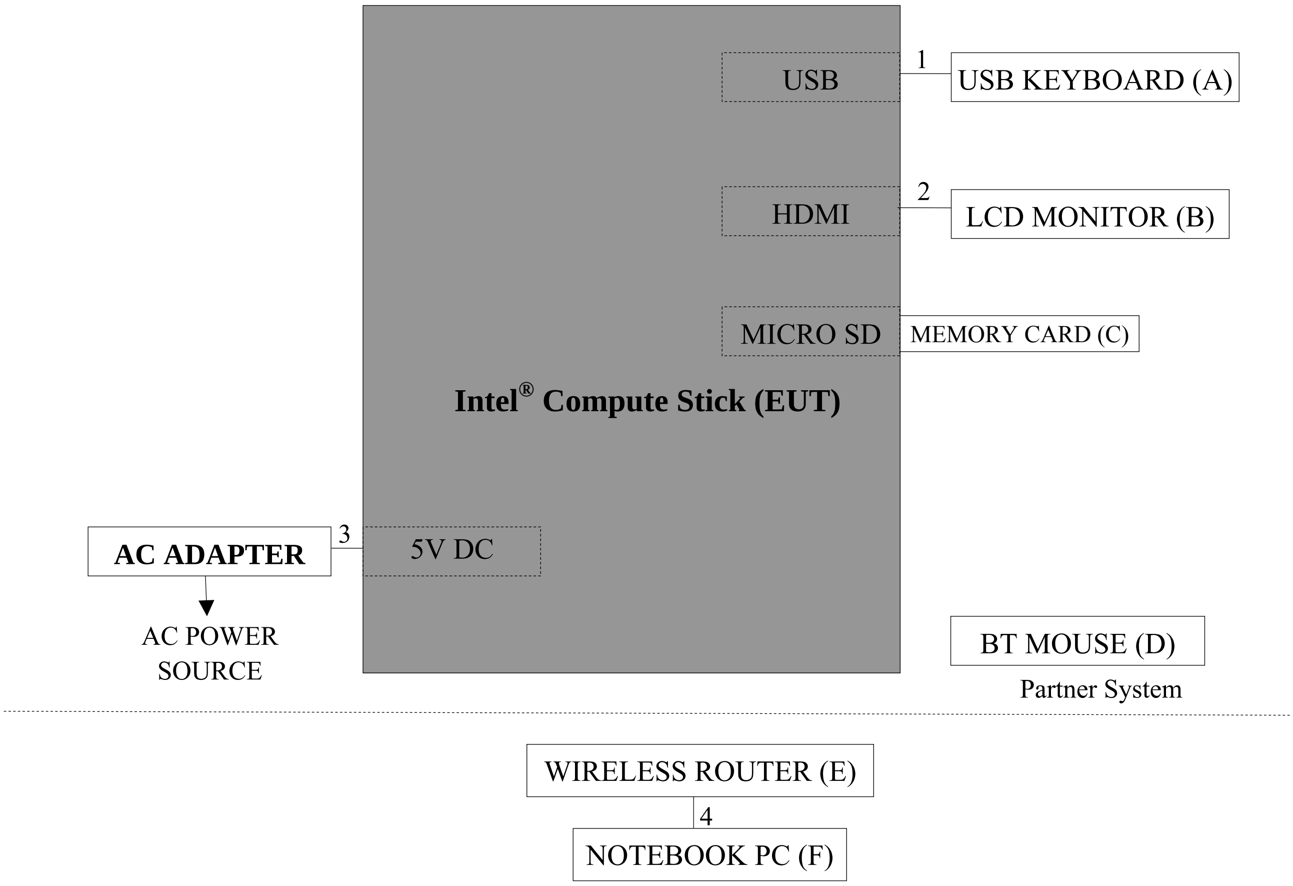
4.1. Test Equipment

The following test equipment was used during the conducted disturbance measurement: (No. 7 Shielded Room)

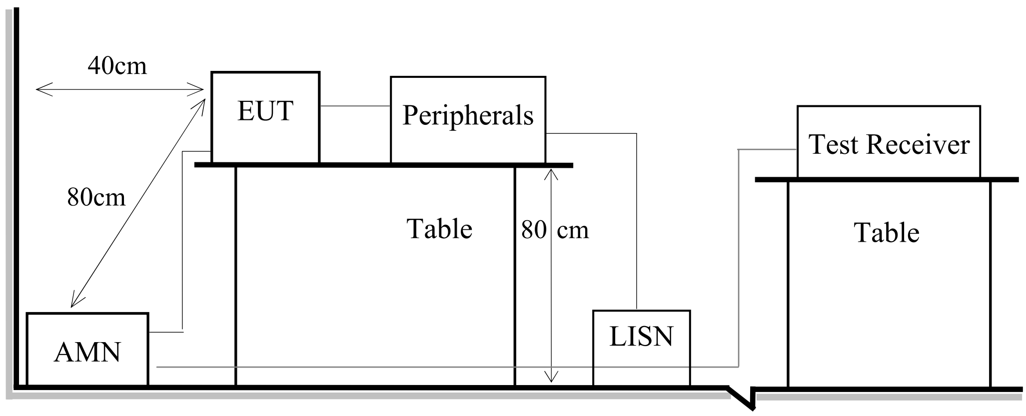
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Test Receiver	R&S	ESCI	101276	2014. 04. 14	2015. 04. 13
2.	A.M.N.	R&S	ESH2-Z5	100366	2014. 03. 11	2015. 03. 10
3.	L.I.S.N.	Kyoritsu	KNW-407	8-1539-3	2015. 01. 22	2016. 01. 21
4.	Pulse Limiter	R&S	ESH3-Z2	101495	2015. 01. 17	2016. 01. 16

4.2. Block Diagram of Test Setup

4.2.1. Block Diagram of connection between EUT and simulators



4.2.2. Shielded Room Setup Diagram



4.3. Limits for Conducted Emission Voltage

(EN 55022, Class B)

Frequency Range	Maximum RF Line Voltage, dB(μV)	
	Quasi-Peak Level	Average Level
0.15MHz – 0.5MHz	66 – 56	56 – 46
0.5MHz – 5MHz	56	46
5MHz – 30MHz	60	50

Remark:
1. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.
2. The lower limit applies at the band edges.

4.4. Operating Condition of EUT

EUT Exercise Program and Condition	
Operating System	Windows 8.1
Test Program	EMC Test
Graphic Function	Display scrolling “H” pattern with respective resolution at the same time.
WLAN Function	To transmit Data transfer to partner Notebook PC
BT Function	To transfer BT signal to Bluetooth mouse
Card reader	Read/Write operation to memory card
The other peripheral devices were driven and operated in turn during all testing.	

4.5. Test Procedure

The EUT was put on table which was above the ground by 80cm and AC adapter's power cord was connected to the AC mains through an Artificial Mains Network (AMN). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (LISN). This provided a 50Ω coupling impedance for the tested equipment.
Both sides of AC line were checked to find out the maximum conducted emission according to EN 55022 regulations during conducted emission measurement.

The bandwidth of the R&S Test Receiver ESCI was set at 9kHz.

The frequency range from 0.15MHz to 30MHz was pre-scanned with a peak detector.

All the final readings from Test Receiver were measured with the Quasi-Peak detector and Average detector. (Remark: If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

4.6. Conducted Disturbance Measurement Results

PASSED. (All emissions not reported below are too low against the prescribed limits.)

The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in next pages.

EUT: Intel® Compute Stick Test Model: STCK1A32WFC

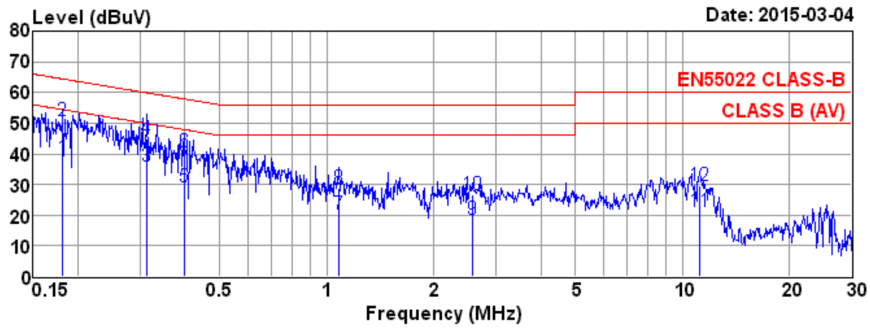
Test Date: 2015. 03. 04 Temperature: 21℃ Humidity: 62%

The details of test mode are as follows:

Configuration Mode	Reference Test Data No.	
	Neutral	Line
SKU #1	# 28	# 27

AUDIX TECHNOLOGY Corp. EMC Department
No.53-11, Dingfu, Linkou Dist.,New Taipei City
244, Taiwan R.O.C.
Tel:+886-2-26092133 Fax:+886-2-26099303
Email:emc@audixtech.com

Data: 28 File: D:\test data\REPORT\2015\C1M1503XXX\C1M1503003-C-D.EM6 (30)



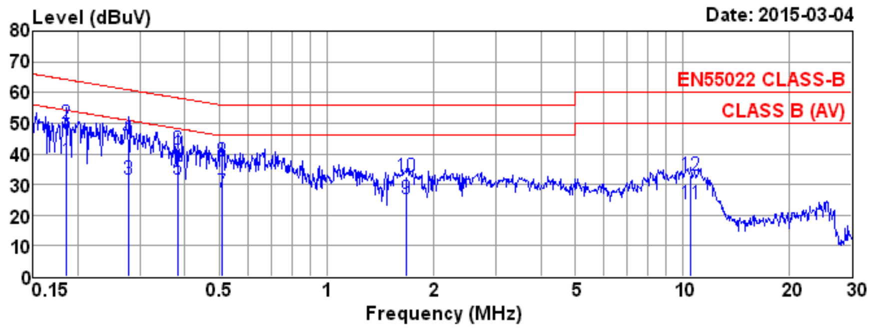
Site no.	: No.7 Shielded Room		Data no.	: 28
Condition	: ESH2-Z5 366		Phase	: NEUTRAL
Limit	: EN55022 CLASS-B			
Env. / Ins.	: 21*C / 62% ESCI (1276)		Engineer	: Kan
EUT	: STCK1A32WFC			
Power Rating	: 230Vac/50Hz			
Test Mode	: SKU #1			

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.182	0.21	0.03	9.85	28.64	38.73	54.42	15.69	Average
2	0.182	0.21	0.03	9.85	40.64	50.73	64.42	13.69	QP
3	0.313	0.22	0.03	9.86	25.76	35.87	49.88	14.01	Average
4	0.313	0.22	0.03	9.86	34.86	44.97	59.88	14.91	QP
5	0.398	0.23	0.03	9.86	19.00	29.12	47.90	18.78	Average
6	0.398	0.23	0.03	9.86	30.34	40.46	57.90	17.44	QP
7	1.082	0.23	0.04	9.85	10.23	20.35	46.00	25.65	Average
8	1.082	0.23	0.04	9.85	18.50	28.62	56.00	27.38	QP
9	2.567	0.28	0.07	9.85	8.31	18.51	46.00	27.49	Average
10	2.567	0.28	0.07	9.85	16.58	26.78	56.00	29.22	QP
11	11.198	0.52	0.15	9.91	10.47	21.05	50.00	28.95	Average
12	11.198	0.52	0.15	9.91	19.00	29.58	60.00	30.42	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
2. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

AUDIX TECHNOLOGY Corp. EMC Department
No.53-11, Dingfu, Linkou Dist.,New Taipei City
244, Taiwan R.O.C.
Tel:+886-2-26092133 Fax:+886-2-26099303
Email:emc@audixtech.com

Data: 27 File: D:\test data\REPORT\2015\C1M1503XXX\C1M1503003-C-D.EM6 (30)



Site no. : No.7 Shielded Room Data no. : 27
Condition : ESH2-Z5 366 Phase : LINE
Limit : EN55022 CLASS-B
Env. / Ins. : 21*C / 62% ESCI (1276) Engineer : Kan
EUT : STCK1A32WFC
Power Rating : 230Vac/50Hz
Test Mode : SKU #1

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.185	0.18	0.03	9.85	27.66	37.72	54.24	16.52	Average
2	0.185	0.18	0.03	9.85	39.75	49.81	64.24	14.43	QP
3	0.279	0.19	0.03	9.86	21.75	31.83	50.85	19.02	Average
4	0.279	0.19	0.03	9.86	34.82	44.90	60.85	15.95	QP
5	0.381	0.19	0.03	9.86	21.74	31.82	48.25	16.43	Average
6	0.381	0.19	0.03	9.86	31.23	41.31	58.25	16.94	QP
7	0.507	0.20	0.03	9.87	17.36	27.46	46.00	18.54	Average
8	0.507	0.20	0.03	9.87	27.72	37.82	56.00	18.18	QP
9	1.680	0.23	0.06	9.86	15.32	25.47	46.00	20.53	Average
10	1.680	0.23	0.06	9.86	22.31	32.46	56.00	23.54	QP
11	10.564	0.45	0.14	9.90	13.35	23.84	50.00	26.16	Average
12	10.564	0.45	0.14	9.90	22.37	32.86	60.00	27.14	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
2. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

5. RADIATED DISTURBANCE MEASUREMENT

5.1. Test Equipment

The following test equipment was used during the radiated disturbance measurement：

5.1.1. For 30MHz~1000MHz Frequency (At No.1 10m Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Spectrum Analyzer	Agilent	N9010A-503	MY52220119	2014. 12. 23	2015. 12. 22
2.	Spectrum Analyzer	Agilent	N9010A-503	MY51250850	2015. 03. 05	2016. 03. 04
3.	Test Receiver	R & S	ESCI7	100922	2014. 05. 06	2015. 05. 05
4.	Amplifier	Sonoma	310N	187158	2015. 03. 04	2016. 03. 03
5.	Amplifier	HP	8447D	2727A06166	2015. 02. 05	2016. 02. 04
6.	Bilog Antenna	TESEQ	CBL6112D	33819	2014. 04. 19	2015. 04. 18
7.	Bilog Antenna	TESEQ	CBL6112D	33820	2014. 04. 19	2015. 04. 18

5.1.2. For Above 1GHz Frequency (At No.1 10m Semi-Anechoic Chamber)

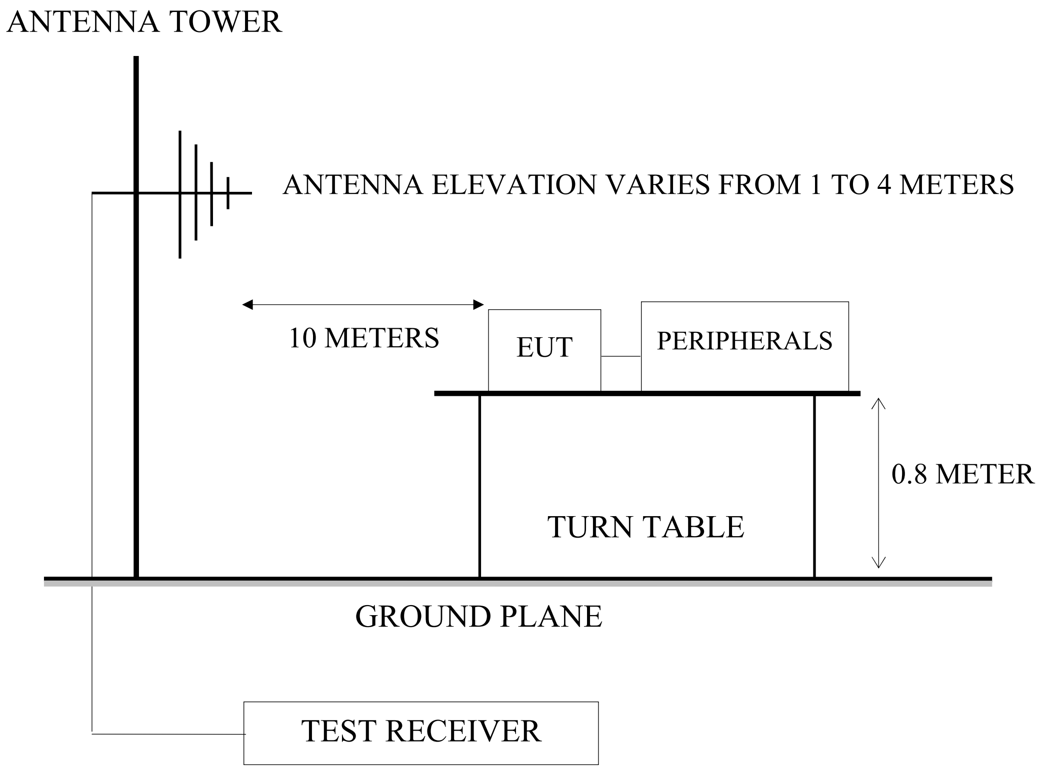
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Spectrum Analyzer	Agilent	N9010A-526	MY51250943	2015. 02. 24	2016. 02. 23
2.	Amplifier	Agilent	8449B	3008A02681	2014. 03. 27	2015. 03. 26
3.	Horn Antenna	EMCO	3117	00114403	2014. 03. 18	2015. 03. 17

5.2. Block Diagram of Test Setup

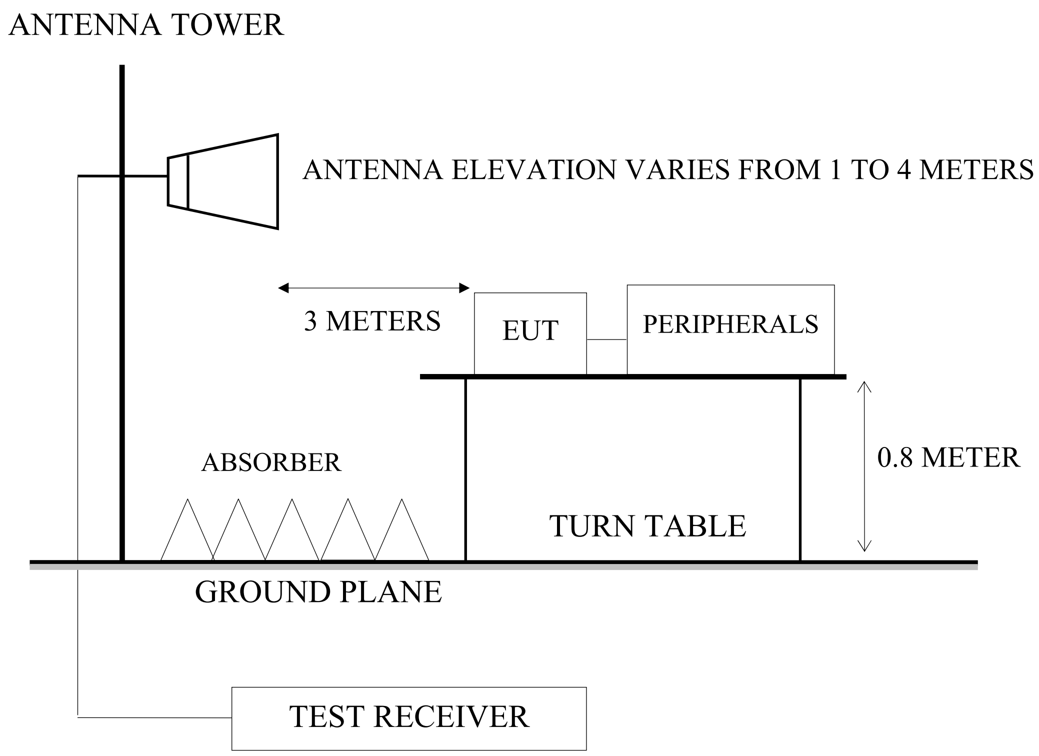
5.2.1. Block Diagram of connection between EUT and simulators

Same as Section 4.2.1.

5.2.2. Semi-Anechoic Camber (10m) Setup Diagram for 30-1000MHz



5.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for Above 1GHz



5.3. Limits for Radiated Disturbance (EN 55022, Class B)

5.3.1. Limit below 1GHz

Frequency (MHz)	Distance (Meters)	Quasi-Peak Limits (dBμV/m)
30 ~ 230	10	30
230 ~ 1000	10	37

Note： (1) The tighter limit applies at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the E.U.T.

5.3.2. Limit above 1GHz

Frequency (GHz)	Distance (Meters)	Average Limits (dBμV/m)	Peak Limits (dBμV/m)
1 ~ 3	3	50	70
3 ~ 6	3	54	74

Note： (1) The lower limit applies at the transition frequency.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the E.U.T.

5.4. Operating Condition of EUT

Same as conducted disturbance measurement which is listed in 4.4.
except the test set up replaced by section 5.2.

5.5. Test Procedure

5.5.1. For Frequency Range 30MHz-1000MHz, which was measuring at Semi-Anechoic Chamber:

The EUT and its simulator were placed on a turn table which was 0.8 meter above ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 10 meters away from the receiving antenna which were mounted on an antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antennas (Bilog Antenna) were used as a receiving antenna. Both horizontal and vertical polarization of the antenna was set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to EN 55022 requirements.

The bandwidth of the R & S Test Receiver ESCI7 was set at 120 kHz.

The frequency range from 30MHz to 1000MHz was checked with Peak detector and all final readings of measurement were with Quasi-Peak detector at Semi-Anechoic Chamber.

5.5.2. For Frequency Range Above 1GHz, which was measuring at Semi-Anechoic Chamber:

The EUT and its simulators were placed on a turn table which was 0.8 meter above ground. The portion of the test volume that was obstructed by absorber placed on the floor (30cm maximum). The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. A calibrated Horn Antenna was used as a receiving antenna. Both horizontal and vertical polarization of the antenna was set on measurement, and both average and peak emission level were recorded form spectrum analyzer. In order to find the maximum emission level, all the interface cables were manipulated according to EN 55022 on radiated measurement.

The resolution bandwidth of the Agilent Spectrum Analyzer N9010A-526 was set at 1MHz.

The frequency range above 1GHz was checked and all final readings of measurement were with Peak and Average detector.

In chapter 7.6.6.1 the standard EN 55016-2-3:2010 requires to include the values of w in the test report:
"w: The dimension of the line tangent to the EUT formed by θ3dB at the measurement distance d. Equation (10) shall be used to calculate w for each actual antenna and measurement distance used. The values of *w* hall be included in the test report. This calculation may be based on the manufacturer-provided receive-antenna beamwidth specifications:
$w = 2 \times d \times \tan(0{,}5 \times \theta_{3dB})$

Frequency GHz	3117 Horn	
	d = 3m	
	$\theta_{3dB\ (min)}$ (°)	$w_{(min)}$ (m)
1.00	88	5.79
2.00	68	4.05
4.00	70	4.20
6.00	52	2.93

The values of *w.* are greater than chapter 7.6.6.1 of Table 3, the minimum dimension of *w*. (*W*min) requirements.

5.6. Radiated Disturbance Measurement Results

PASSED. (All emissions not reported below are too low against the prescribed limits.)

For 30MHz~1000MHz frequency range:

The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in section 5.6.1.

EUT: Intel® Compute Stick   Test Model: STCK1A32WFC

Test Date: 2015. 03. 13   Temperature: 19℃   Humidity: 52%

The details of test mode are as follows:

Configuration Mode	Reference Test Data No.	
	Horizontal	Vertical
SKU #1	# 4	# 3

For Above 1GHz frequency range:

The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in section 5.6.2.

EUT: Intel® Compute Stick   Test Model: STCK1A32WFC

Test Date: 2015. 03. 13   Temperature: 19℃   Humidity: 52%

The details of test mode are as follows:

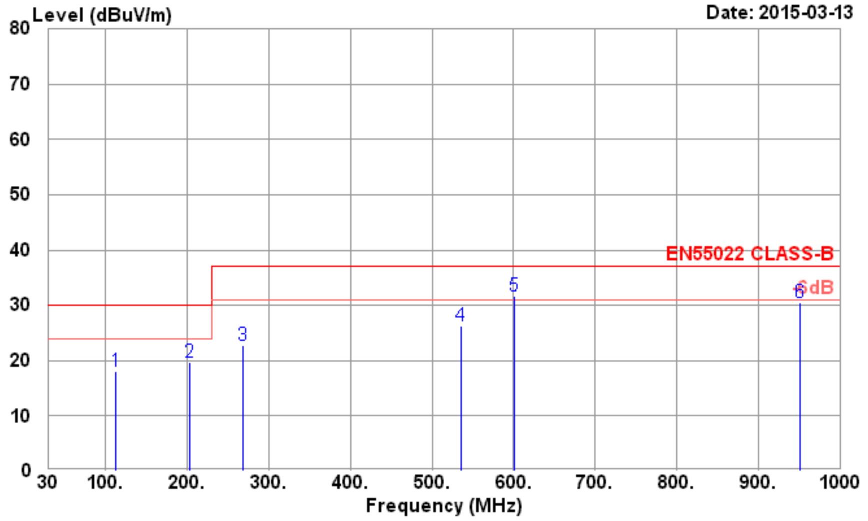
Configuration Mode	Reference Test Data No.	
	Horizontal	Vertical
SKU #1	# 4	# 3

5.6.1. Radiated Disturbance Measurement Results at Semi-Anechoic Chamber (30 - 1000MHz)

AUDIX

AUDIX TECHNOLOGY Corp. EMC Department
No.53-11, Dingfu, Linkou Dist.,New Taipei City
244, Taiwan R.O.C.
Tel:+886-2-26092133 Fax:+886-2-26099303
Email:emc@audixtech.com

Data: 4 File: D:\TEST DATA\REPORT\2015\C1M1503XXX\C1M1503003\C1M1503003-10M.EM6 (1



Site no. : NO.1 10M Chamber
Dis. / Ant. : 10m 6112D 33820
Limit : EN55022 CLASS-B
Env. / Ins. : 19*C / 52%
EUT : STCK1A32WFC
Power Rating : 230Vac/50Hz
Test Mode : SKU#1

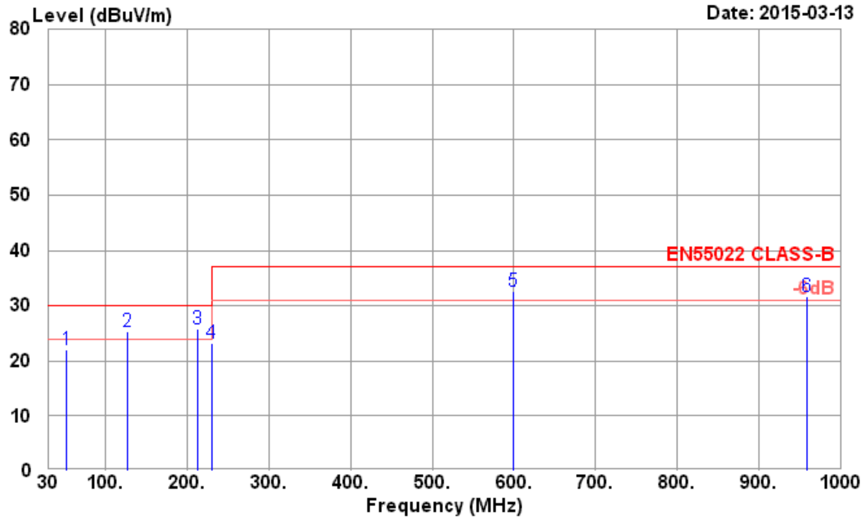
Data no. : 4
Ant. pol. : HORIZONTAL
Engineer : TIM

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	112.45	11.85	1.79	4.45	18.09	30.00	11.91	QP
2	203.63	9.51	2.48	7.64	19.63	30.00	10.37	QP
3	267.65	12.69	2.91	7.16	22.76	37.00	14.24	QP
4	536.34	17.54	4.33	4.48	26.35	37.00	10.65	QP
5	601.33	18.37	4.64	8.56	31.57	37.00	5.43	QP *
6	950.53	21.00	6.04	3.35	30.39	37.00	6.61	QP

Remarks: 1.Emission Level= Antenna Factor + Cable Loss + Reading.
2.The emission levels that are 20dB below the official limit are not reported
3.The worst emission was 31.57dBuV/m at 601.33 MHz when antenna was in horizontal polarization, 1.5m height and turn table was at 110°.
4.Degree is calculated from 0° clockwise facing the antenna.

AUDIX TECHNOLOGY Corp.   EMC Department
No.53-11, Dingfu, Linkou Dist.,New Taipei City
244, Taiwan R.O.C.
Tel:+886-2-26092133   Fax:+886-2-26099303
Email:emc@audixtech.com

Data: 3   File: D:\TEST DATA\REPORT\2015\C1M1503XXX\C1M1503003\C1M1503003-10M.EM6 (1



Site no.   : NO.1 10M Chamber   Data no. : 3
Dis. / Ant.   : 10m 6112D 33819   Ant. pol. : VERTICAL
Limit   : EN55022 CLASS-B
Env. / Ins.   : 19*C / 52%   Engineer : TIM
EUT   : STCK1A32WFC
Power Rating : 230Vac/50Hz
Test Mode   : SKU#1

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	52.31	7.88	0.83	13.44	22.15	30.00	7.85	QP
2	126.03	11.92	1.36	12.04	25.32	30.00	4.68	QP
3	212.36	10.04	1.83	13.83	25.70	30.00	4.30	QP
4	229.82	11.14	1.92	10.26	23.32	30.00	6.68	QP
5	599.39	18.26	3.37	11.09	32.72	37.00	4.28	QP *
6	958.29	21.07	4.41	6.27	31.75	37.00	5.25	QP

Remarks: 1.Emission Level= Antenna Factor + Cable Loss + Reading.
2.The emission levels that are 20dB below the official limit are not reported

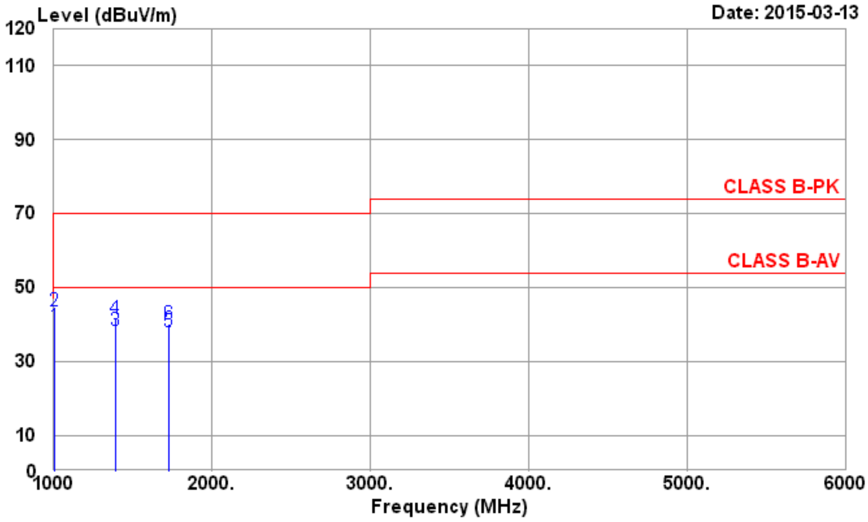
3. The worst emission was 32.72dBuV/m at 599.39MHz when antenna was in vertical polarization, 2.0m height and turn table was at 260°.

4. Degree is calculated from 0° clockwise facing the antenna.

5.6.2. Radiated Disturbance Measurement Results at Semi-Anechoic Camber (Above 1GHz)

AUDIX TECHNOLOGY Corp. EMC Department
No.53-11, Dingfu, Linkou Dist.,New Taipei City
244, Taiwan R.O.C.
Tel:+886-2-26092133 Fax:+886-2-26099303
Email:emc@audixtech.com

Data: 4 File: D:\TEST DATA\REPORT\2015\C1M1503XXX\C1M1503003\C1M1503003-1G.EM6 (10



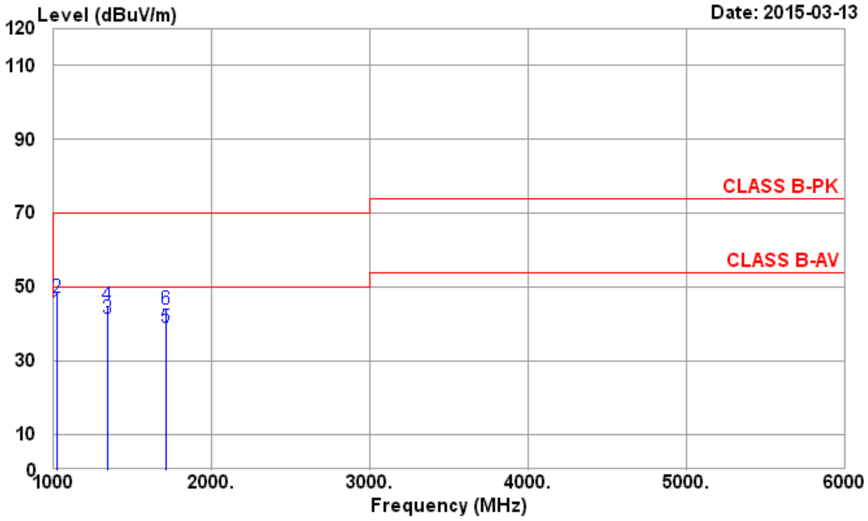
Site no. : NO.1 10M Chamber Data no. : 4
Dis. / Ant. : 3m 3117 14403 Ant. pol. : HORIZONTAL
Limit : CLASS B-PK
Env. / Ins. : 19*C / 52% Engineer : TIM
EUT : STCK1A32WFC
Power Rating : 230Vac/50Hz
Test Mode : SKU#1

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	1005.21	27.70	1.77	36.33	46.39	39.53	50.00	10.47	Average
2	1005.21	27.70	1.77	36.33	50.66	43.80	70.00	26.20	Peak
3	1390.36	27.86	2.13	35.83	44.36	38.52	50.00	11.48	Average
4	1390.36	27.86	2.13	35.83	47.47	41.63	70.00	28.37	Peak
5	1730.36	29.67	2.30	35.60	41.79	38.16	50.00	11.84	Average
6	1730.36	29.67	2.30	35.60	43.87	40.24	70.00	29.76	Peak

Remarks: 1.Emission Level= Antenna Factor + Cable Loss + Reading - Preamp.
2.The emission levels that are 20dB below the official limit are not reported

AUDIX TECHNOLOGY Corp. EMC Department
No.53-11, Dingfu, Linkou Dist.,New Taipei City
244, Taiwan R.O.C.
Tel:+886-2-26092133 Fax:+886-2-26099303
Email:emc@audixtech.com

Data: 3 File: D:\TEST DATA\REPORT\2015\C1M1503XXX\C1M1503003\C1M1503003-1G.EM6 (10



Site no. : NO.1 10M Chamber
Dis. / Ant. : 3m 3117 14403
Limit : CLASS B-PK
Env. / Ins. : 19*C / 52%
EUT : STCK1A32WFC
Power Rating : 230Vac/50Hz
Test Mode : SKU#1

Data no. : 3
Ant. pol. : VERTICAL
Engineer : TIM

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	1020.21	27.71	1.78	36.31	50.04	43.22	50.00	6.78	Average
2	1020.21	27.71	1.78	36.31	54.15	47.33	70.00	22.67	Peak
3	1340.23	27.84	2.09	35.90	47.45	41.48	50.00	8.52	Average
4	1340.23	27.84	2.09	35.90	51.18	45.21	70.00	24.79	Peak
5	1710.37	29.55	2.30	35.61	42.98	39.22	50.00	10.78	Average
6	1710.37	29.55	2.30	35.61	47.90	44.14	70.00	25.86	Peak

Remarks: 1.Emission Level= Antenna Factor + Cable Loss + Reading - Preamp.
2.The emission levels that are 20dB below the official limit are not reported

6. HARMONICS CURRENT MEASUREMENT

6.1. Test Equipment

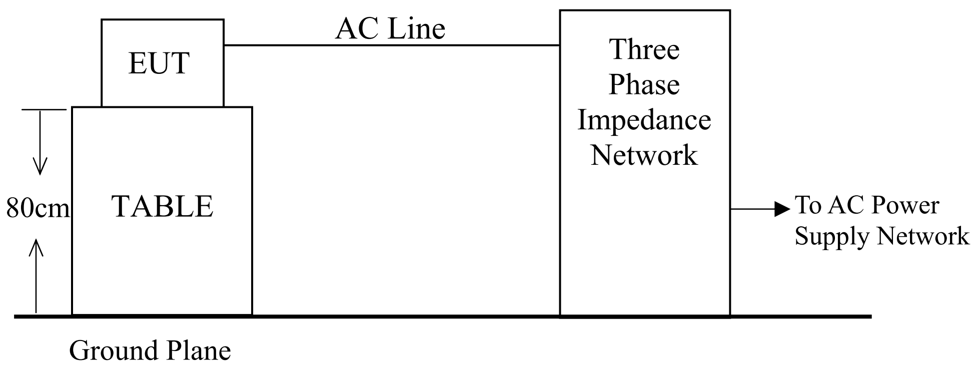
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	AC Power Source	TESEQ	NSG 1007-45	1248A04038	2014. 01. 17	2016. 01. 16
2.	Signal Conditioning Unit	TESEQ	CCN 1000-3	1234A03680	2014. 01. 17	2016. 01. 16
3.	Three Phase Impedance Network	TESEQ	INA 2197	1234A03681	2014. 01. 17	2016. 01. 16
4.	Profline AC Switching Unit	TESEQ	NSG 2200-3	EK 22713	2014. 01. 17	2016. 01. 16

6.2. Block Diagram of Test Setup

6.2.1. Block Diagram of connection between EUT and simulators

Same as Section 4.2.1.

6.2.2. Test Setup



6.3. Test Standard

EN 61000-3-2:2014

6.4. Deviation From Test Standard

No deviation.

6.5. Limit for Harmonics Current (Class D Equipment)

Harmonic order n	Maximum permissible harmonic current per watt mA/W	Maximum permissible harmonic current A
Odd Harmonics Only		
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13	0.30	0.21
$15 \leq n \leq 39$	3.85/n	0.15x15/n

No limits apply for equipment with an active input power up to and including 75W.

6.6. Operating Condition of EUT

Same as conducted emission measurement which is listed in 4.4.
except the test set up replaced by section 6.2.

6.7. Test Procedure

6.7.1. Apply a 230V/50Hz rated test voltage which shall be maintained within ±2.0% and the frequency within ±0.5% of the nominal value to EUT.

6.7.2. Let EUT work as stated and through Universal Power Analyzer to measure the EUT to get the harmonic current for Odd & Even harmonics up to 40th.

6.8. Test Results

PASSED. (Complied with Criterion D)

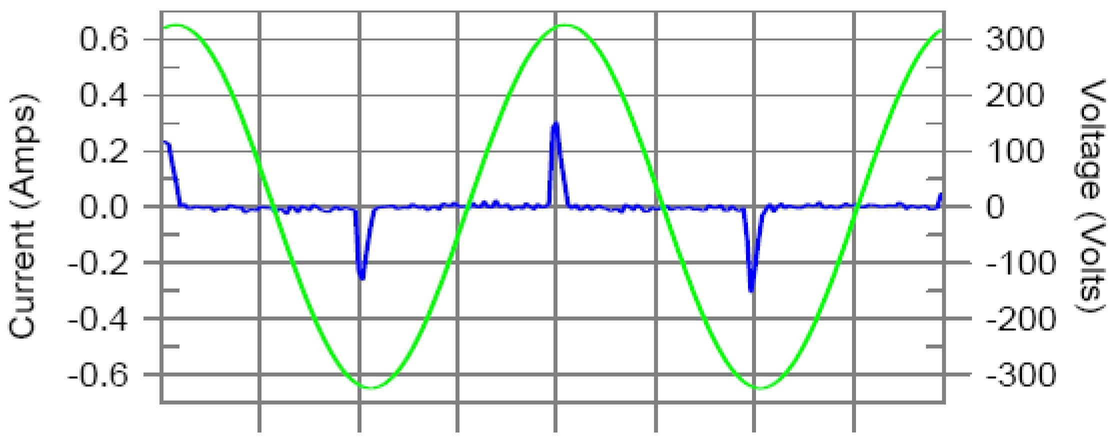
The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in next pages.

Harmonics – Class-D (Run time)

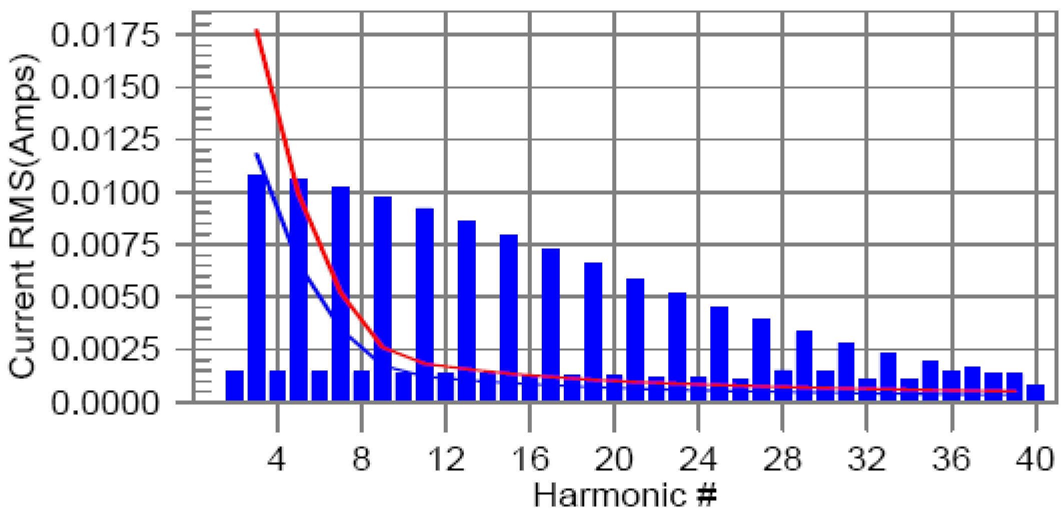
EUT: STCK1A32WFC
Tested by: Sam Yan
Test category: Class-D (European limits)
Test Margin: 100
Test date: 2015/3/11
Test duration (min): 2.5
Data file name: H-000499.cts_data
Comment: SKU#1

Test Result: N/L Source qualification: Normal

Current & voltage waveforms



Harmonics and Class D limit line European Limits



Test result: N/L Worst harmonic was #19 with 930.4% of the limit.

Current Test Result Summary (Run time)

EUT: STCK1A32WFC Tested by: Sam Yan
Test category: Class-D European limits) Test Margin: 100
Test date: 2015/3/11
Test duration (min): 2.5 Data file name: H-000499.cts_data
Comment: SKU#1

Test Result: N/L Source qualification: Normal
THC(A): 0.000 I-THD(%): 0.0 POHC(A): 0.000 POHC Limit(A): 0.000
Highest parameter values during test:

V_RMS (Volts):	230.07	Frequency(Hz):	50.00
I_Peak (Amps):	0.327	I_RMS (Amps):	0.053
I_Fund (Amps):	0.016	Crest Factor:	7.867
Power (Watts):	3.5	Power Factor:	0.368

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.000						
3	0.011	0.012	N/A	0.010	0.018	N/A	N/L
4	0.000						
5	0.011	0.007	N/A	0.010	0.010	N/A	N/L
6	0.000						
7	0.010	0.003	N/A	0.010	0.005	N/A	N/L
8	0.000						
9	0.010	0.002	N/A	0.009	0.003	N/A	N/L
10	0.000						
11	0.009	0.001	N/A	0.009	0.002	N/A	N/L
12	0.000						
13	0.009	0.001	N/A	0.008	0.002	N/A	N/L
14	0.000						
15	0.008	0.001	N/A	0.008	0.001	N/A	N/L
16	0.000						
17	0.007	0.001	N/A	0.007	0.001	N/A	N/L
18	0.000						
19	0.007	0.001	N/A	0.006	0.001	N/A	N/L
20	0.000						
21	0.006	0.001	N/A	0.006	0.001	N/A	N/L
22	0.000						
23	0.005	0.001	N/A	0.005	0.001	N/A	N/L
24	0.000						
25	0.005	0.001	N/A	0.000	0.001	N/A	N/L
26	0.000						
27	0.004	0.000	N/A	0.000	0.001	N/A	N/L
28	0.000						
29	0.003	0.000	N/A	0.000	0.001	N/A	N/L
30	0.000						
31	0.003	0.000	N/A	0.000	0.001	N/A	N/L
32	0.000						
33	0.002	0.000	N/A	0.000	0.001	N/A	N/L
34	0.000						
35	0.002	0.000	N/A	0.000	0.001	N/A	N/L
36	0.000						
37	0.002	0.000	N/A	0.000	0.001	N/A	N/L
38	0.000						
39	0.001	0.000	N/A	0.000	0.001	N/A	N/L
40	0.000						

Note: The EUT power level is below 75.0 Watts and therefore has no defined limits

7. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

7.1. Test Equipment

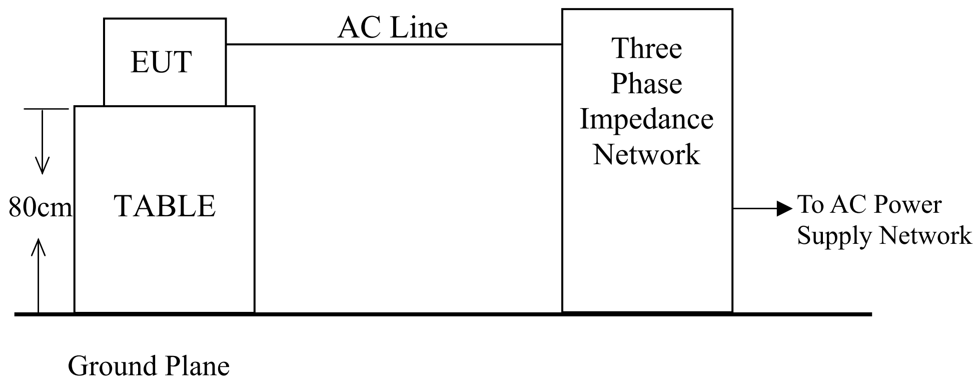
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	AC Power Source	TESEQ	NSG 1007-45	1248A04038	2014. 01. 17	2016. 01. 16
2.	Signal Conditioning Unit	TESEQ	CCN 1000-3	1234A03680	2014. 01. 17	2016. 01. 16
3.	Three Phase Impedance Network	TESEQ	INA 2197	1234A03681	2014. 01. 17	2016. 01. 16
4.	Profline AC Switching Unit	TESEQ	NSG 2200-3	EK 22713	2014. 01. 17	2016. 01. 16

7.2. Block Diagram of Test Setup

7.2.1. Block Diagram of connection between EUT and simulators

Same as Section 4.2.1.

7.2.2. Test Setup



7.3. Test Standard

EN 61000-3-3:2013

7.4. Deviation From Test Standard

No deviation.

7.5. Limit for Voltage Fluctuation and Flicker

Tested Items	Description	Limit
*P*st	Short-term Flicker Indicator	≤ 1.0
*P*lt	Long-term Flicker Indicator	≤ 0.65
d(t)	Voltage change more than 500ms	≤ 3.3%
*d*c	Relative steady-state voltage change	≤ 3.3%
*d*max	Maximum relative voltage change	≤ 4%
	Maximum relative voltage change	≤ 6%
	Maximum relative voltage change	≤ 7%

7.6. Operating Condition of EUT

Same as conducted emission measurement which is listed in 4.4.
except the test set up replaced by section 7.2.

7.7. Test Procedure

Apply a 230V/50Hz rated test voltage which shall be maintained within ±2.0% and the frequency within ±0.5% of the nominal value to EUT.

7.8. Test Results

PASSED.

The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in next page.

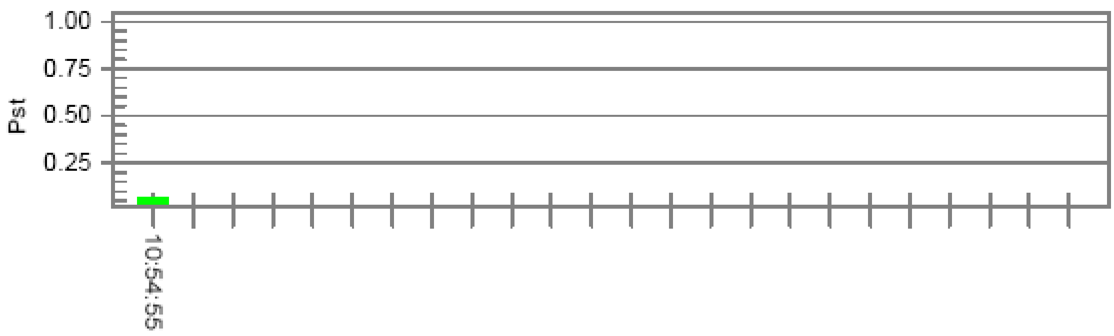
Remark: Due to the maximum r.m.s input current (including inrush current) does not exceed 20A, and the supply current after inrush is within a variation band of 1.5A, it's not applicable to test the manual switching.

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

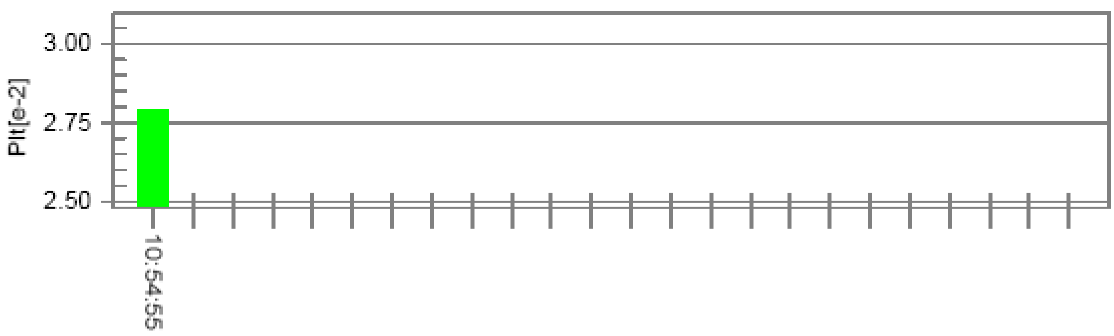
EUT: STCK1A32WFC
Tested by: Sam Yan
Test category: dt,dmax,dc and Pst (European limits)
Test Margin: 100
Test date: 2015/3/11
Test duration (min): 10
Data file name: F-000500.cts_data
Comment: SKU#1

Test Result: Pass
Status: Test Completed

Pst and limit line — European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.04			
Highest dt (%):	0.00	Test limit (%):	3.30	Pass
Tmax(mS) > dt:	0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass

8. ELECTROSTATIC DISCHARGE IMMUNITY TEST

8.1. Test Equipment

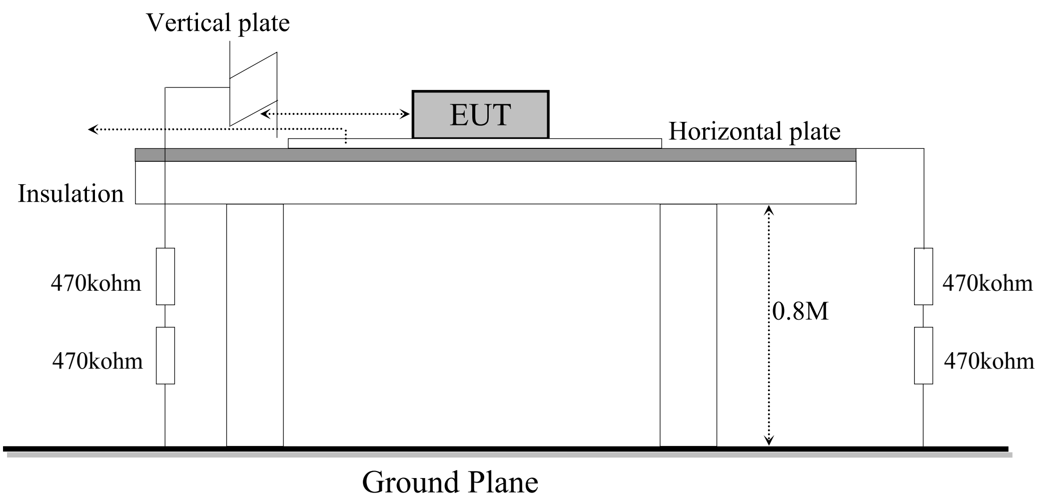
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	ESD Simulator	EM TEST	dito	V0503100055	2014. 04. 21	2015. 04. 20

8.2. Block Diagram of Test Setup

8.2.1. Block Diagram of connection between EUT and simulators

Same as Section 4.2.1.

8.2.2. Test Setup



8.3. Test Standard and Levels and Performance Criterion

EN 55024:2010 (EN 61000-4-2:2009/IEC 61000-4-2 Ed 2.0:2008)		
Test Specification (Test Level)		Performance Criteria
Contact Discharge	±2kV and ±4kV	**B**
Air Discharge	±2kV, ±4kV and ±8kV	

8.4. Deviation From Test Standard

Contact Discharge mode level up to ±10 kV
Air Discharge mode level up to ±12kV

8.5. Test Procedure

8.5.1. Air Discharge

This test is done on a non-conductive surfaces. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the ESD generator discharge electrode shall be removed from the EUT. The generator is then retrigged for a new single discharge and repeated 10 discharges each at positive and negative polarity for each preselected test point. This procedure shall be repeated until all the air discharge completed.

8.5.2. Contact Discharge

All the procedure shall be same as 8.5.1. except that the tip of the discharge electrode shall touch the EUT conductive surfaces & repeated 25 discharges each at positive and negative polarity for each test point before the discharge switch is operated.

8.5.3. Indirect discharge for horizontal coupling plane

At least 25 discharges each at positive and negative polarity shall be applied to the horizontal coupling plane, at points on each side of the EUT. The ESD generator positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

8.5.4. Indirect discharge for vertical coupling plane

At least 25 discharges each at positive and negative polarity shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

8.5.5. For above tests, the voltage was increased from the minimum to the selected test level.

8.6. Test Results

PASSED. (Complied with Criterion A).

The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in next page.

Electrostatic Discharge Immunity Test Results

AUDIX TECHNOLOGY CORPORATION

Applicant: INTEL CORP.	Test Date: 2015. 03. 12 Atmospheric Pressure: 99kPa
EUT: Intel® Compute Stick, Test Model: STCK1A32WFC	Temperature: 20 °C
Power Supply: AC 230V, 50Hz (Via AC Adapter)	Humidity: 50 %
Working Condition: See section 4.4.	**Test Configuration Mode: SKU #1**
Engineer: Jacky Chen	

Air Discharge	**Voltage kV Level / Discharge per polarity 10 / Result**												
Test Location	+2	-2	+4	-4	+8	-8	+10	-10	+12	-12			Comments
HDMI (1)	ND	ND	A	A	A	A	A	A	A	A			
DC IN (2)	ND	ND	A	A	A	A	A	A	A	A			
USB (3)	ND	ND	A	A	A	A	A	A	A	A			
SD Card Slot (4)	ND	ND	A	A	A	A	A	A	A	A			
LED (5)	ND	ND	ND	ND	A	A	A	A	A	A			
Button(6)	ND	ND	A	A	A	A	A	A	A	A			
Hole*4 (7 ~ 10)	ND	ND	A	A	A	A	A	A	A	A			
Seam*7 (11 ~ 17)	ND	ND	ND	ND	A	A	A	A	A	A			
Contact Discharge	**Voltage kV Level / Discharge per polarity 25 / Result**												
Test Location	+2	-2	+4	-4	+6	-6	+8	-8	+9	-9	+10	-10	Comments
													Note
Indirect Contact	**Voltage kV Level / Discharge per polarity 25 / Result**												
Test Location	+2	-2	+4	-4	+6	-6	+8	-8	+9	-9	+10	-10	Comments
VCP Front	A	A	A	A	A	A	A	A	A	A	A	A	
VCP Right	A	A	A	A	A	A	A	A	A	A	A	A	
VCP Left	A	A	A	A	A	A	A	A	A	A	A	A	
VCP Back	A	A	A	A	A	A	A	A	A	A	A	A	
HCP Bottom	A	A	A	A	A	A	A	A	A	A	A	A	
Additional Notes													
Measurement Points	**Please refer to the Photos of ESD Test Points**												

ND=No Discharge; Meets criteria but unable to obtain an electrostatic discharge (ESD) at this test point.

Note: Due to the EUT has no conductive surface. It's not necessary to test contact discharge.

9. RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST

9.1. Test Equipment

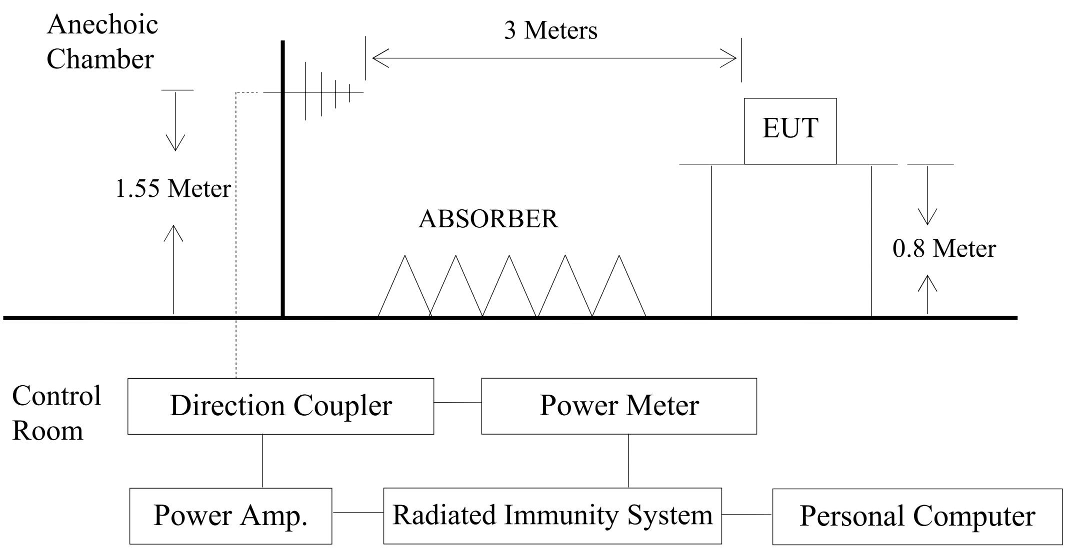
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Radiated Immunity System	TESEQ	ITS 6006	033009	2014. 10. 01	2015. 09. 30
2.	Power Amplifier	TESEQ	CBA 1G-275	T44214	N.C.R.	N.C.R.
3.	Power Meter	TESEQ	PM 6006	073365	2014. 10. 04	2015. 10. 03
4.	Power Antenna	Schwarzbeck	STLP 9128 E	9128E084	N.C.R.	N.C.R.
5.	Direction Coupler	TESEQ	C5982-10	98618	2014. 08. 13	2015. 08. 12

9.2. Block Diagram of Test Setup

9.2.1. Block Diagram of connection between EUT and simulators

Same as Section 4.2.1.

9.2.2. Test Setup



9.3. Test Standard and Levels and Performance Criterion

EN 55024:2010 (EN 61000-4-3: 2006+A1:2008+A2:2010/IEC 61000-4-3 Ed.3.2:2010)		
Test Specification (Test Level)		Performance Criteria
Frequency Range	80-1000MHz	**A**
Field Strength	3V/m (unmodulated, r.m.s)	
Modulation & Signal	80%, 1kHz	

9.4. Deviation From Test Standard

No deviation.

9.5. Test Procedure

The field sensor is placed on the EUT table (0.8 meter above the ground) which is 3 meters away from the transmitting antenna. Through the signal generator, power amplifier and transmitting antenna to produce a uniformity field strength (3V/m measured by field sensor) around the EUT table from frequency range 80MHz-1000MHz and records the signal generator‘s output level at the same time for whole measured frequency range. Then, put EUT and its simulators on the EUT turn table and keep them 3 meter away from the transmitting antenna which is mounted on an antenna tower and fixes at 1.55 meter height above the ground. Using the recorded signal generator’s output level to measure the EUT from frequency range 80MHz-1000MHz and both horizontal & vertical polarization of antenna must be set and measured. Each of the four sides of EUT must be faced this transmitting antenna and measures individually.
In this report, chose the most sensible side to measure, that is right side to face transmitting antenna.

A CCD camera was put inside the chamber and through its display to monitor the EUT operational situation to judge the EUT Compliance criterion during measurement.

All the scanning conditions are as follows：

Condition of Test	Remarks
1. Field Strength	3V/m
2. Amplitude Modulated	1kHz, 80%AM
3. Scanning Frequency	80MHz – 1000MHz Step Size 1% increments
4. The Rate of Sweep	0.0015 decade/s
5. Dwell Time	3 Sec.

9.6. Test Results

PASSED. (Complied with Criterion A)

The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in next page.

Radiated Electromagnetic Field Immunity Test Results

AUDIX TECHNOLOGY CORPORATION

Applicant: INTEL CORP.	Test Date: 2015. 03. 09
EUT: Intel® Compute Stick, Test Model: STCK1A32WFC	Temperature: 21 °C
Power Supply: AC 230V, 50Hz (Via AC Adapter)	Humidity: 43 %
Working Condition: See section 4.4.	**Test Configuration Mode: SKU #1**
Engineer: Mike Yu	

Frequency Rang	Position (Angle)	Polarity of Antenna	Field Strength (V/m)	Results	Performance Criterion
80-1000MHz	0°	Horizontal	3V/m+Modulated	Pass	**A**
80-1000MHz	90°	Horizontal	3V/m+Modulated	Pass	**A**
80-1000MHz	180°	Horizontal	3V/m+Modulated	Pass	**A**
80-1000MHz	270°	Horizontal	3V/m+Modulated	Pass	**A**
80-1000MHz	0°	Vertical	3V/m+Modulated	Pass	**A**
80-1000MHz	90°	Vertical	3V/m+Modulated	Pass	**A**
80-1000MHz	180°	Vertical	3V/m+Modulated	Pass	**A**
80-1000MHz	270°	Vertical	3V/m+Modulated	Pass	**A**

10.ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

10.1.Test Equipment

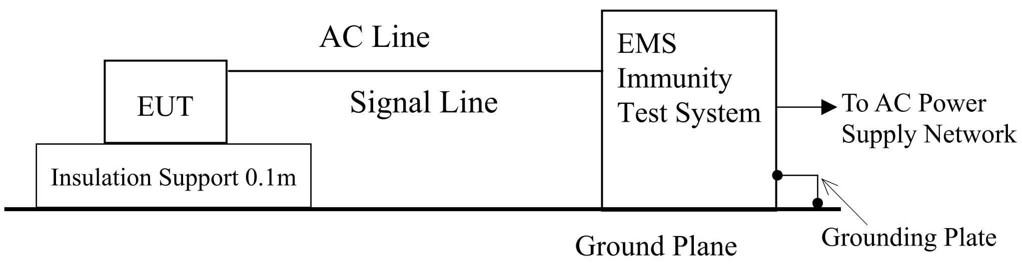
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	EMS Immunity Test System	TESEQ	NSG 3060	1519	2014. 08. 13	2015. 08. 12
2.	C.D.N.	TESEQ	CDN 3063	2074	2014. 08. 13	2015. 08. 12
3.	Burst/EFT Dataline Coupling Clamp	TESEQ	CDN 3425	1717	2014. 08. 13	2015. 08. 12

10.2.Block Diagram of Test Setup

10.2.1. Block Diagram of connection between EUT and simulators

Same as Section 6.2.1.

10.2.2. Test Setup



10.3.Test Standard and Levels and Performance Criterion

EN 55024:2010 (EN 61000-4-4:2012/IEC 61000-4-4 Ed3.0:2012)	
Test Specification (Test Level)	Performance Criteria
Signal and control ports : ±0.5kV AC mains power input ports : ±1kV	**B**
Tr/Th : 5/50ns	
Repetition frequency : 5kHz	

10.4.Deviation From Test Standard

No deviation.

10.5. Test Procedure

The EUT and its simulators shall be placed 0.1m high above the ground reference plane which was a minimum area 1m x 1m metallic sheet with 0.65mm minimum thickness. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

10.5.1. For input and output AC power ports:

The EUT was connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines, and the length of the power line between the coupling device and the EUT shall be 1m or less. Both polarities of the test voltage should be applied during compliance test and the duration of the test can‘t less than 1min.

10.5.2. For signal lines and control lines ports:

The interface cables‘ length is less than 3m, therefore, it’s unnecessary to measure.

10.5.3. For DC input and DC output power ports:

No DC ports. It‘s unnecessary to measure.

10.6. Test Results

PASSED. (Complied with Criterion A)

The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in next page.

Electrical Fast Transient/Burst Immunity Test Results

AUDIX TECHNOLOGY CORPORATION

Applicant: INTEL CORP.	Test Date: 2015. 03. 09
EUT: Intel® Compute Stick, **Test Model: STCK1A32WFC**	Temperature: 20 °C
Power Supply: AC 230V, 50Hz (Via AC Adapter)	Humidity: 55 %
Working Condition: See section 4.4.	**Test Configuration Mode: SKU #1**
Engineer: Jason Chen	

Inject Place: AC Main Power Supply Port

Inject Line	Test Voltage	Inject Time	Inject Method	Results & Criterion
L1	±0.5kV, ±1kV	60s	Direct	**Pass, A**
L2	±0.5kV, ±1kV	60s	Direct	**Pass, A**
L1, L2	±0.5kV, ±1kV	60s	Direct	**Pass, A**

11.SURGE IMMUNITY TEST

11.1.Test Equipment

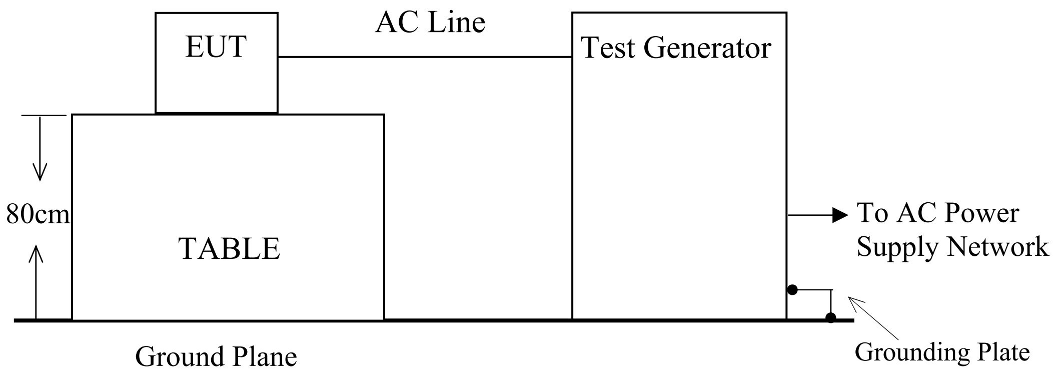
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Control Center	Keytek	E103	9506267	N.C.R.	N.C.R.
2.	Surge Combination Wave	Thermo	E501B	1003193	2015. 02. 24	2016. 02. 23
3.	Surge Coupler / Decoupler	Thermo	E4551	1003195	2015. 02. 24	2016. 02. 23

11.2.Block Diagram of Test Setup

11.2.1. Block Diagram of connection between EUT and simulators

Same as Section 4.2.1.

11.2.2. Test Setup



Remark: Test generator includes control center、 surge combination and coupler.

11.3.Test Standard and Levels and Performance Criterion

EN 55024:2010 (EN 61000-4-5/IEC 61000-4-5 Ed. 2.0:2005)	
Test Specification (Test Level)	Performance Criteria
Telecommunication ports : ±1kV **AC input and output power ports** --line to line : ±1kV --line to earth : ±2kV	**B**
Tr/Th : 1.2/50 (8/20) µs	

11.4.Deviation From Test Standard

No deviation.

11.5.Test Procedure

11.5.1. Set up the EUT and test generator as shown on section 11.2.

11.5.2. For line to line coupling mode, provided a 0.5/1kV 1.2/50 μs current surge (at open-circuit condition) and 8/20 μs current surge to EUT selected points.

11.5.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1 pulse/min repetition rate were conducted during test.

11.5.4. Different phase angles were done individually.

11.5.5. Repeat procedure 11.5.2. to 11.5.4. except the open-circuit test voltages 0.5kV/1kV/2kV for line to earth coupling mode test.

11.5.6. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

11.6.Test Results

PASSED. (Complied with Criterion A).

The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in next page.

Surge Immunity Test Results

AUDIX TECHNOLOGY CORPORATION

Applicant: INTEL CORP.	Test Date: 2015. 03. 09
EUT: Intel® Compute Stick, Test Model: STCK1A32WFC	Temperature: 20 °C
Power Supply: AC 230V, 50Hz (Via AC Adapter)	Humidity: 55 %
Working Condition: See section 4.4.	**Test Configuration Mode: SKU #1**
Engineer: Jason Chen	

Input And Output AC Power Port

Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage	Results & Criterion
L-N	+	0, 90, 180, 270°	5	±0.5kV; ±1kV	**Pass, A**
L-N	-		5	±0.5kV; ±1kV	**Pass, A**

12. IMMUNITY TO CONDUCTED DISTURBANCES INDUCED BY RF FIELDS

12.1. Test Equipment

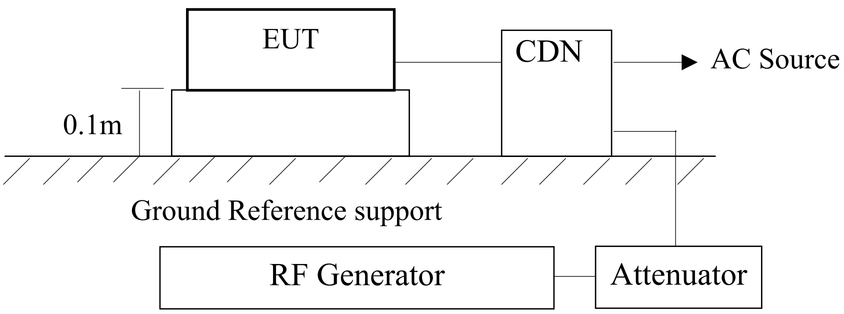
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	RF Generator	TESEQ	NSG 4070B-30	035076	2014. 11. 05	2015. 11. 04
2.	6dB Attenuator	TESEQ	ATN 6050	38424	2015. 03. 09	2016. 03. 08
3.	CDN	TESEQ	CDN M016	34607	2014. 11. 05	2015. 11. 04

12.2. Block Diagram of Test Setup

12.2.1. Block Diagram of connection between EUT and simulators

Same as Section 4.2.1.

12.2.2. Common Mode Test Setup



12.3. Test Standard and Levels and Performance Criterion

EN 55024:2010 (EN 61000-4-6:2014/IEC 61000-4-6 Ed. 4.0:2013)		
Test Specification (Test Level)		Performance Criteria
Signal and telecommunication ports, AC Input and Output Power Ports		
Frequency Range	0.15-80MHz	**A**
Field Strength	3V (unmodulated, r.m.s)	
Modulation	80% AM (1kHz)	

12.4. Deviation From Test Standard

No deviation.

12.5. Test Procedure

12.5.1. Set up the EUT, CDN and test generators as shown on section 12.2.

12.5.2. The EUT and supporting equipment were placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) was placed on the ground plane making contact with it at about 0.1-0.3m from EUT. Cables between CDN and EUT were as short as possible.

12.5.3. The disturbance signal described below was injected to EUT through CDN.

12.5.4. The EUT operates within its operational mode(s) under intended climatic conditions after power on.

12.5.5. The frequency range was swept from 0.15 to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.

12.5.6. The rate of sweep shall not exceed 1.5*10^3decades/s. Where the frequency was swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

12.5.7. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

12.6. Test Results

PASSED. (Complied with Criterion A)

The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in next page.

Immunity to Conducted Disturbances Induced by RF Fields Test Results

AUDIX TECHNOLOGY CORPORATION

Applicant: INTEL CORP.	Test Date: 2015. 03. 16
EUT: Intel® Compute Stick, **Test Model: STCK1A32WFC**	Temperature: 20 °C
Power Supply: AC 230V, 50Hz (Via AC Adapter)	Humidity: 52 %
Working Condition: See section 4.4.	**Test Configuration Mode: SKU #1**
Engineer: Xar Xhuo	

Frequency Rang	Injected Position	Field Strength (V/m)	Results	Performance Criterion
0.15-80MHz	Main Port (AC Power Line)	3V/m+Modulated	Pass	**A**

Modulation Signal : 1kHz 80% AM.

13.POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

13.1.Test Equipment

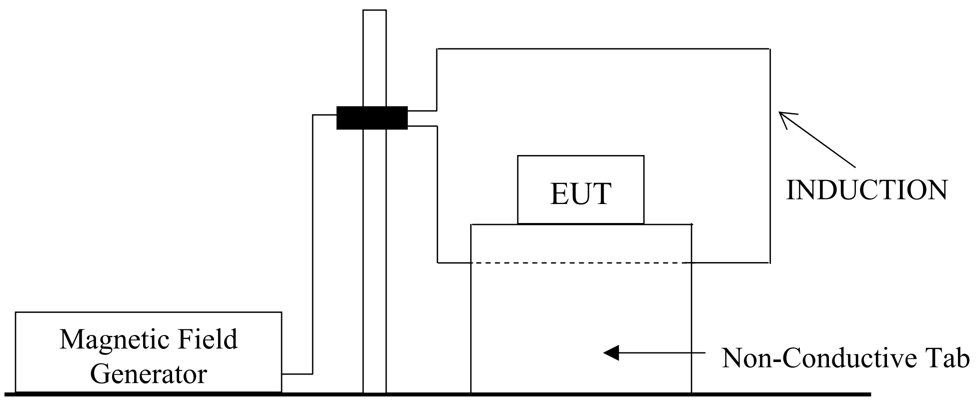
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Magnetic Field Generator	Haefely Trench	MAG100.1	080015-01	2014. 05. 15	2015. 05. 14

13.2.Block Diagram of Test Setup

13.2.1. Block Diagram of connection between EUT and simulators

Same as Section 4.2.1.

13.2.2. Test Setup



13.3.Test Standard and Levels and Performance Criterion

EN 55024:2010 (EN 61000-4-8:2010/IEC 61000-4-8 Ed. 2.0:2009)		
Test Specification (Test Level)		Performance Criteria
Power Frequency	50Hz or 60Hz	**A**
Magnetic Field Strength	1A/m (rms)	

13.4.Deviation From Test Standard

No deviation.

13.5. Test Procedure

The EUT was placed on 0.8m high table. And subjected to the test magnetic field by using the induction coil of standard dimensions (1m x 1m). The induction coil rotated by 90 degrees in order to expose the EUT to the test field with different orientations.
All cables of EUT exposed to magnetic field for 1m of their length

13.6. Test Results

PASSED. (Complied with Criterion A)

The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in next page.

Power Frequency Magnetic Field Immunity Test Results

AUDIX TECHNOLOGY CORPORATION

Applicant: INTEL CORP.	Test Date: 2015. 03. 11
EUT: Intel® Compute Stick, **Test Model: STCK1A32WFC**	Temperature: 23 °C
Power Supply: AC 230V, 50Hz (Via AC Adapter)	Humidity: 47 %
Working Condition: See section 4.4.	**Test Configuration Mode: SKU #1**
Engineer: Sam Yen	

Power Frequency	Magnetic Field	Coil Orientation	Testing Duration	Results	Performance Criterion
50Hz	1A/m	X-axis	1 Min	Pass	**A**
50Hz	1A/m	Y-axis	1 Min	Pass	**A**
50Hz	1A/m	Z-axis	1 Min	Pass	**A**

14. VOLTAGE DIPS/SHORT INTERRUPTIONS/VOLTAGE VARIATIONS IMMUNITY TEST

14.1. Test Equipment

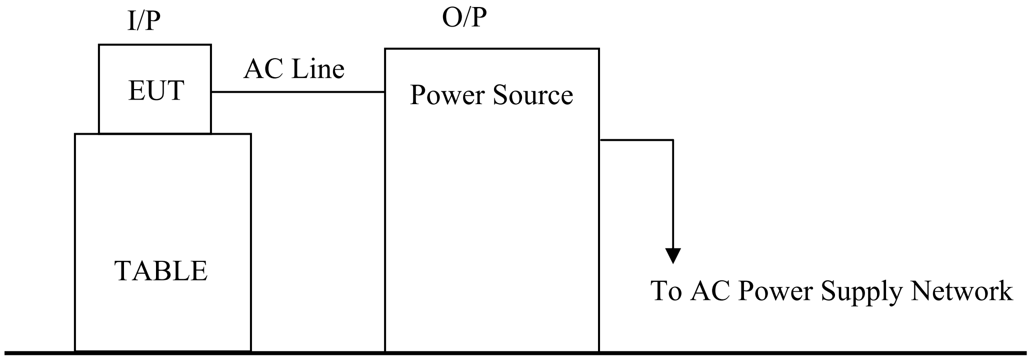
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Power Source	Chroma	6590	65900086	2014. 07. 18	2015. 07. 17

14.2. Block Diagram of Test Setup

14.2.1. Block Diagram of connection between EUT and simulators

Same as Section 6.2.1.

14.2.2. Test Setup



14.3. Test Standard and Levels and Performance Criterion

EN 55024:2010 (EN 61000-4-11:2004/IEC 61000-4-11 Ed.2.0:2004)		
Test Specification (Test Level)		Performance Criteria
Voltage dips	>95% reduction, 0.5period	**B**
	30% reduction , 25period	**C**
Voltage interruptions	>95% reduction , 250period	**C**

14.4. Deviation From Test Standard

No deviation.

14.5. Test Procedure

14.5.1. Set up the EUT and test generator as shown on section 14.2.

14.5.2. The interruptions was introduced at selected phase angles with specified duration. There was a 10s minimum interval between each test event.

14.5.3. After each test a full functional check was performed before the next test.

14.5.4. Repeat procedures 14.5.2 & 14.5.3 for voltage dips, only the test level and duration was changed.

14.5.5. Record any degradation of performance.

14.6. Test Results

PASSED. (Complied with Criterion C in Voltage Interruption & Criterion A in Voltage Dips)

The EUT with **the worst test mode (SKU #1)** was measured and the test results are listed in next page.

Voltage Dips/Short Interruptions/Voltage Variations Immunity Test Results

AUDIX TECHNOLOGY CORPORATION

Applicant: INTEL CORP.	Test Date: 2015. 03. 11
EUT: Intel® Compute Stick, **Test Model: STCK1A32WFC**	Temperature: 23 °C
Power Supply: AC 100 ~ 240V, 50/60Hz (Via AC Adapter)	Humidity: 47 %
Working Condition: See section 4.4.	**Test Configuration Mode: SKU #1**
Engineer: Sam Yen	

Single Test Voltage

Type of Test	Test Voltage	Phase Angle	Reduction	Period	Results & Performance Criterion
Voltage Dips	(1)100V (2)240V	0, 45, 90, 135, 180, 225, 270, 315°	>95%	0.5	**Pass, A**
		0, 45, 90, 135, 180, 225, 270, 315°	30%	25	**Pass, A**
Voltage Interruptions	(1)100V (2)240V	0, 45, 90, 135, 180, 225, 270, 315°	>95%	250	**Pass C, Note**

Note: Criteria C, The EUT was shut down during the test. It can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions after test.

15.PHOTOGRAPHS

15.1.Photos of Conducted Disturbance Measurement



FRONT VIEW OF CONDUCTED MEASUREMENT



BACK VIEW OF CONDUCTED MEASUREMENT

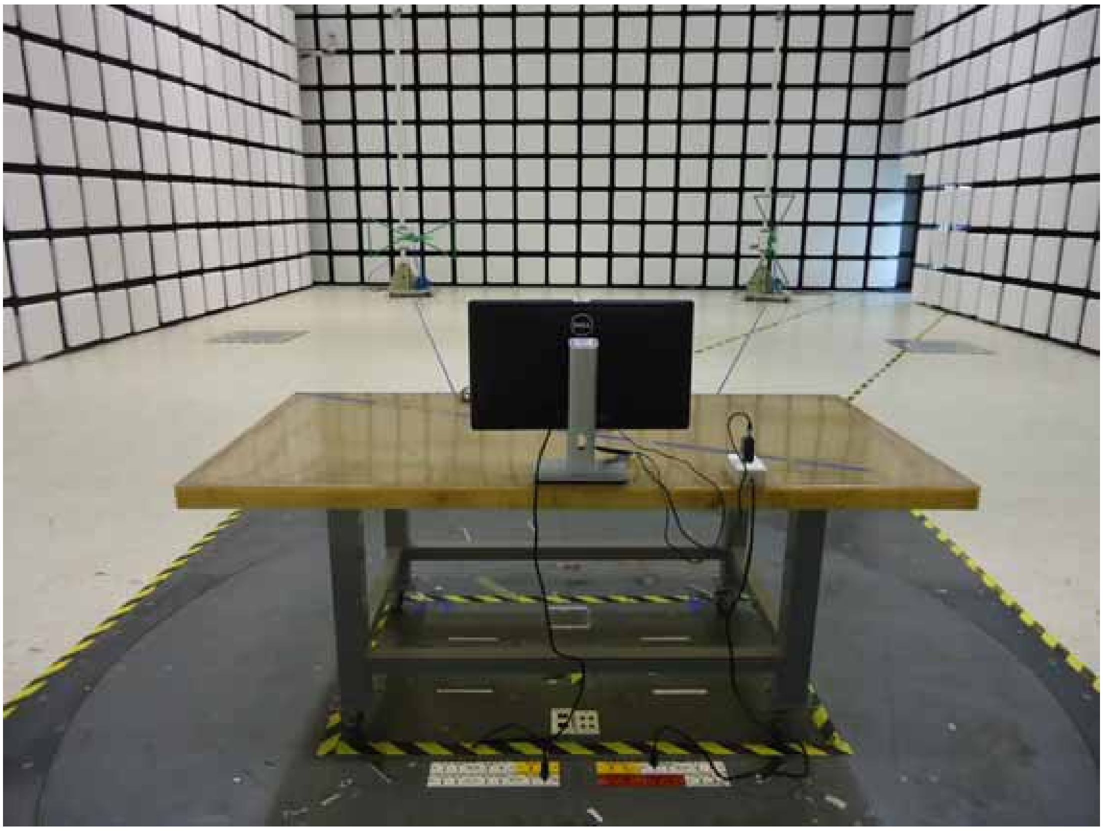


ZOOM-IN VIEW OF EUT

15.2.Photos of Radiated Disturbance Measurement at Semi-Anechoic Chamber (30-1000MHz)

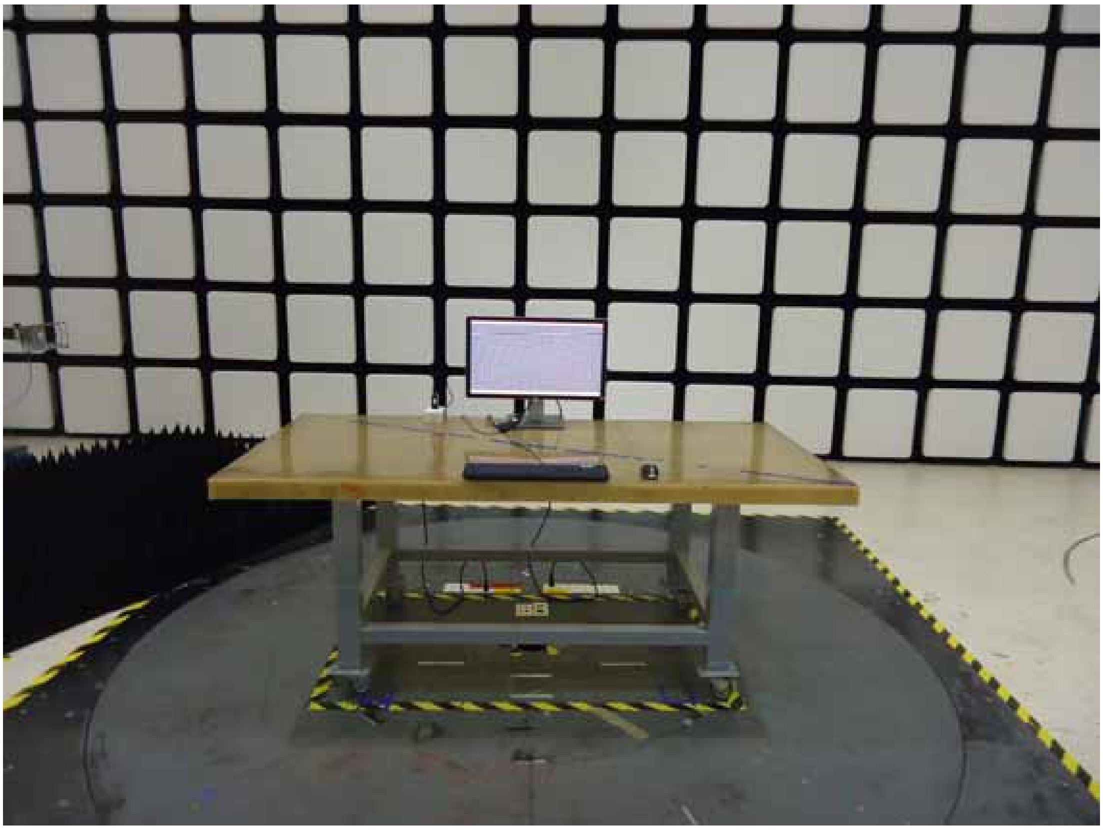


FRONT VIEW OF RADIATED MEASUREMENT

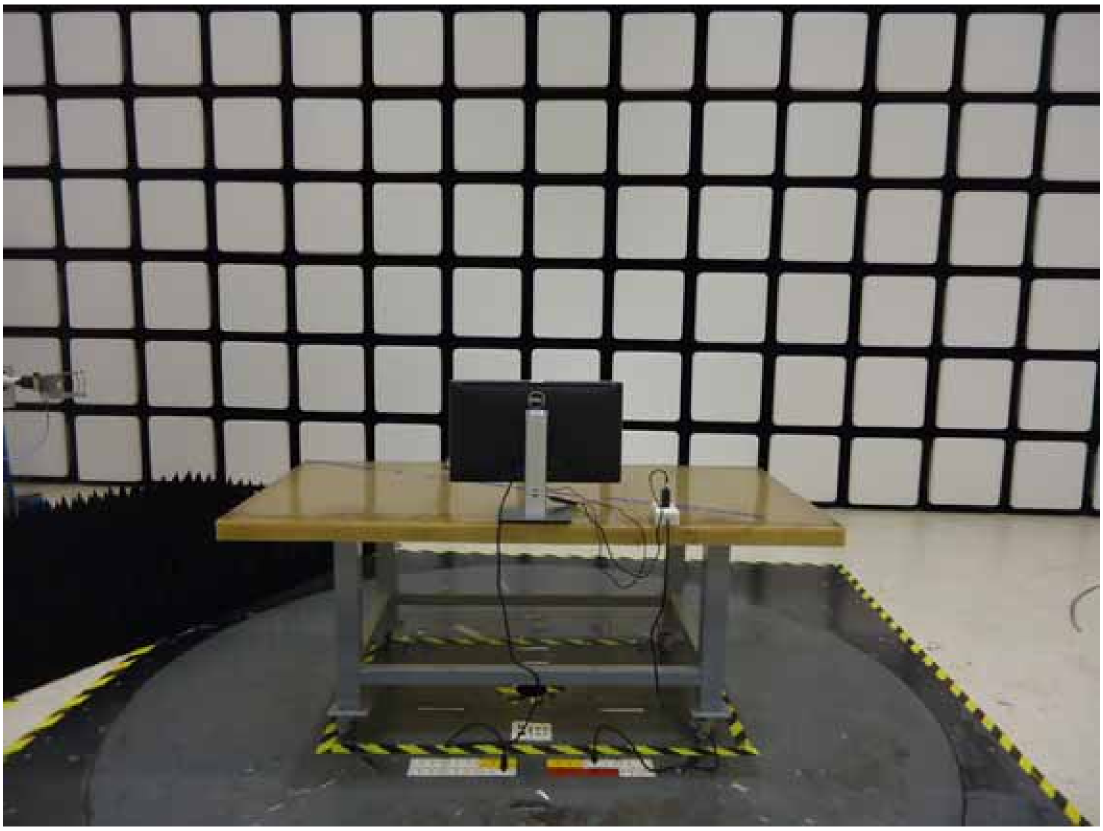


BACK VIEW OF RADIATED MEASUREMENT

15.3.Photo of Radiated Disturbance Measurement at Semi-Anechoic Chamber (Above 1GHz)



FRONT VIEW OF RADIATED MEASUREMENT



BACK VIEW OF RADIATED MEASUREMENT

15.4.Photo of Harmonics Current Measurement



15.5.Photo of Voltage Fluctuation and Flicks Measurement



15.6. Photos of Electrostatic Discharge Immunity Test

For Air & Contact Discharge



For VCP Test





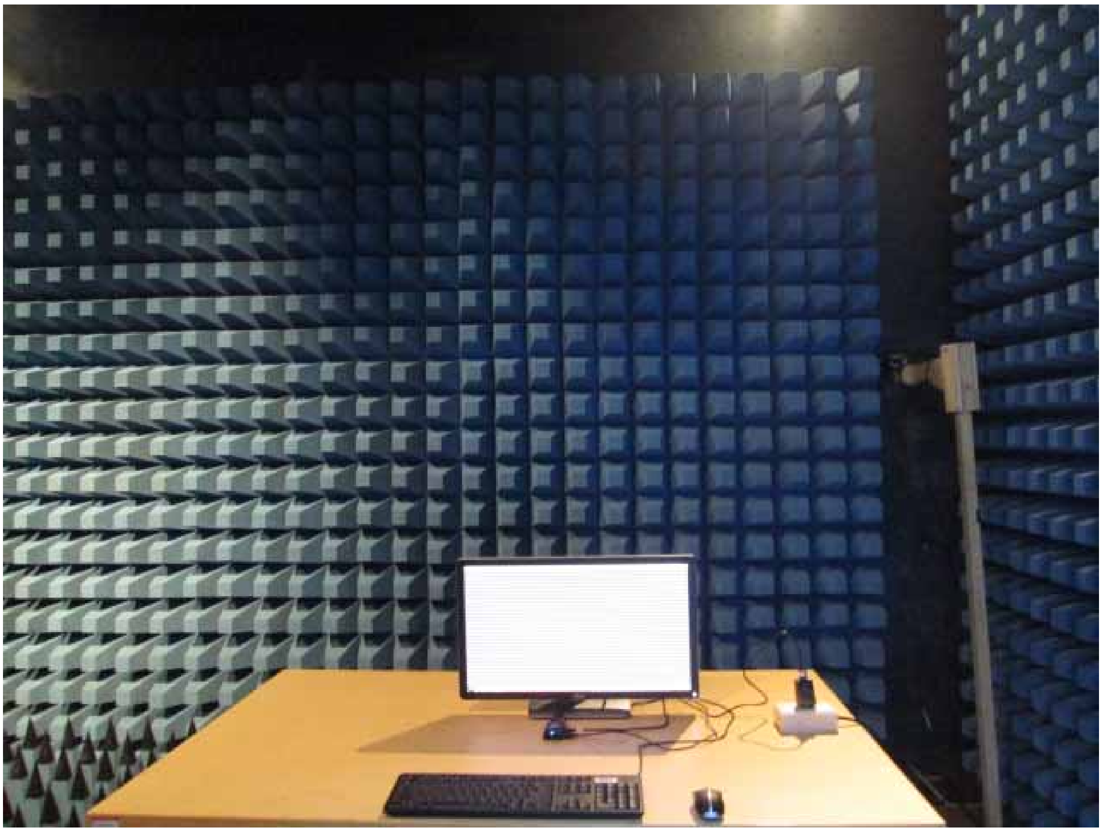
Photo of ESD Test Points

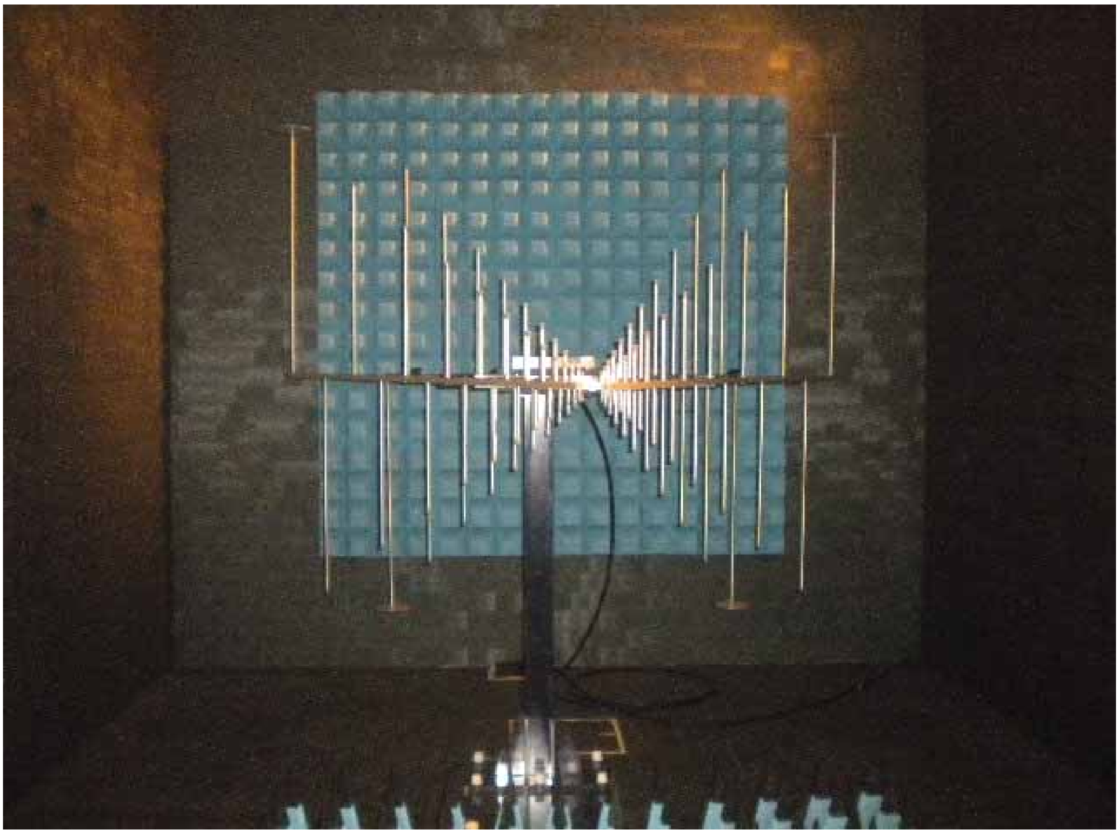


Photo of ESD Test Points

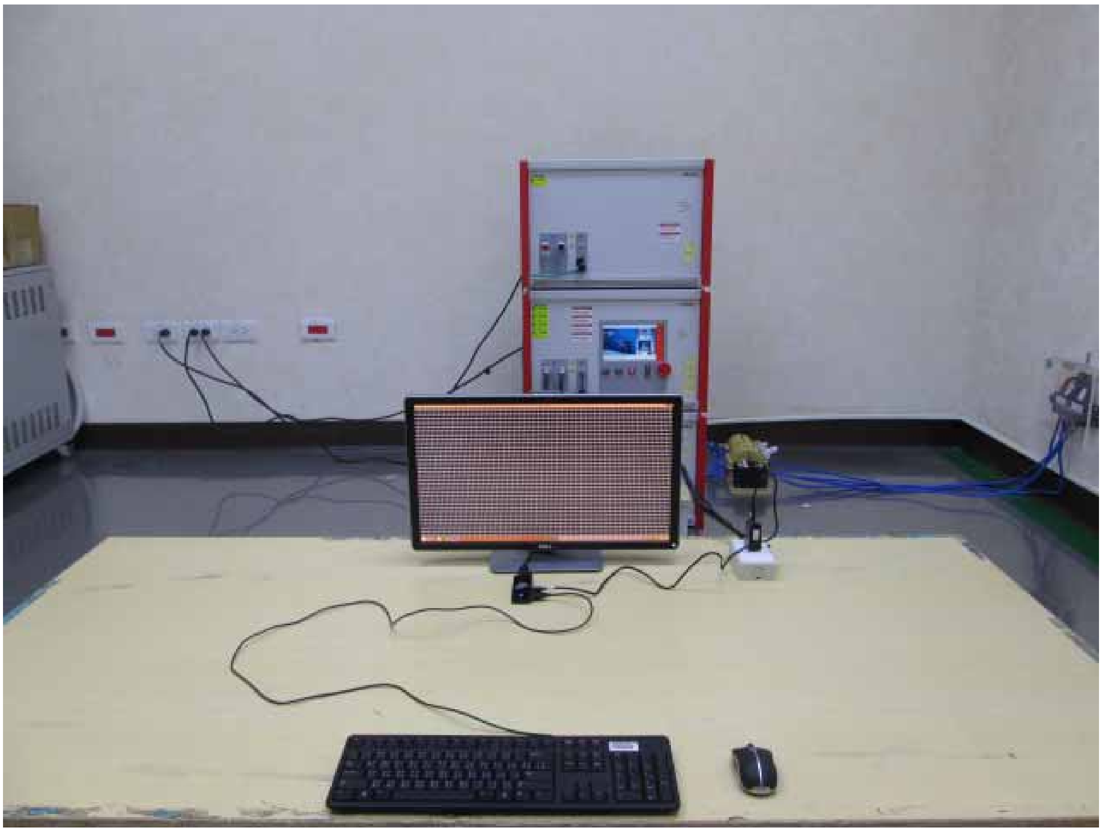


15.7.Photos of Radiated, Radio-Frequency, Electromagnetic Field Immunity Test

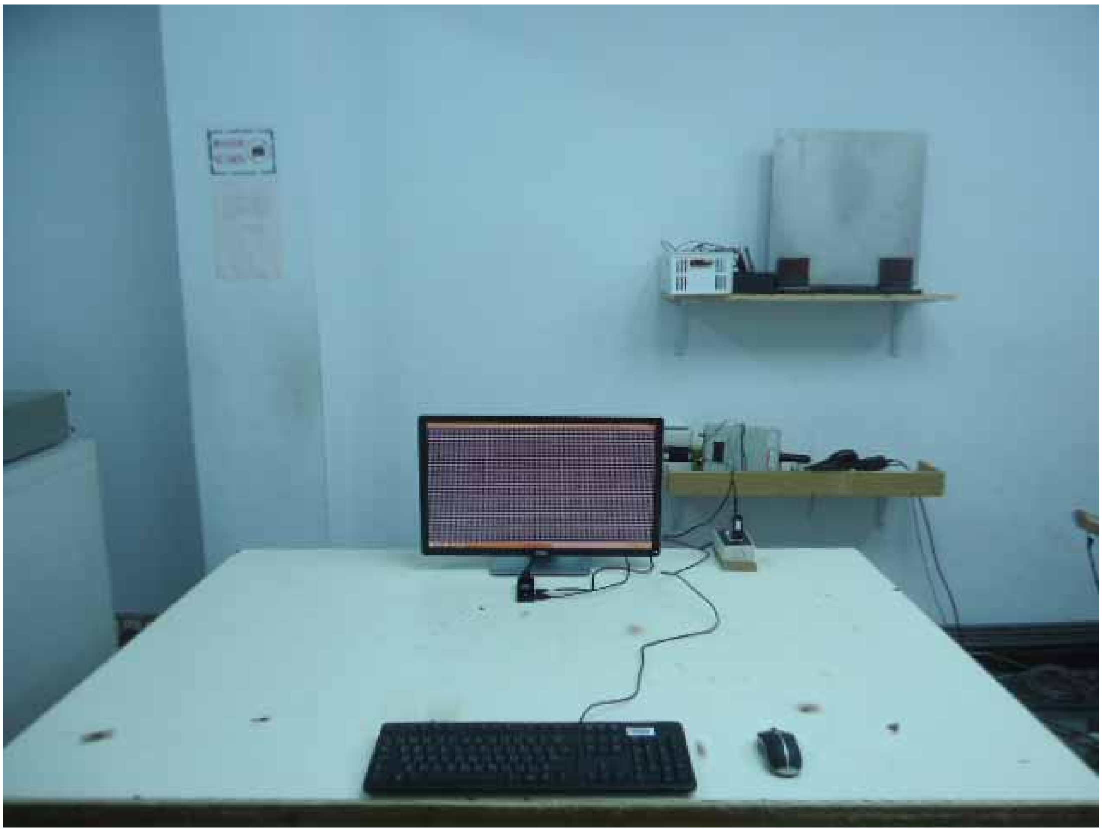




15.8.Photos of Electrical Fast Transient/Burst Immunity Test



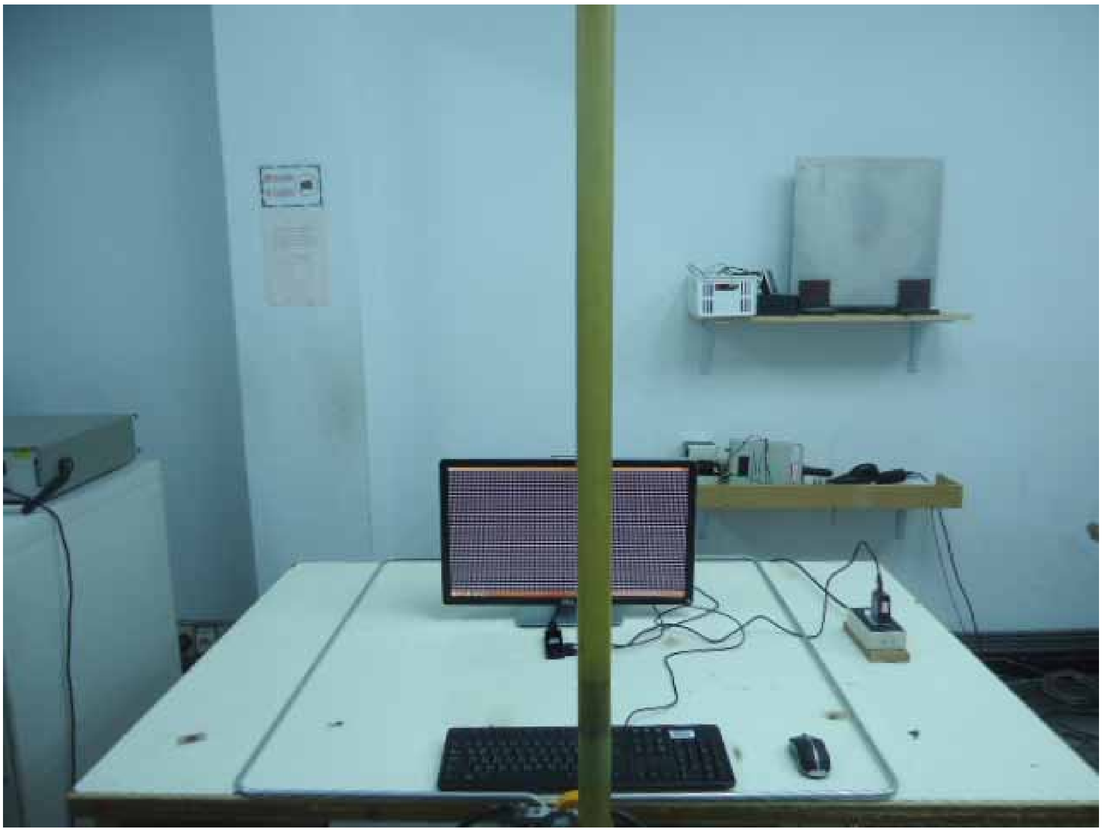
15.9.Photo of Surge Immunity Test



15.10.Photos of Immunity to Conducted Disturbances Induced by RF Fields



15.11.Photo of Power Frequency Magnetic Field Immunity Test



15.12.Photo of Voltage Dips/Short Interruptions/Voltage Variations Immunity Test





PARTNER SYSTEM